THE American Journal OF Gastroenterology

VOL. 31, NO. 4 APRIL, 1959

Vitamin K Therapy in Liver Disease—Need for a Reevaluation

Primary Idiopathic Segmental Infarction of the Greater Omentum

Gastrointestinal Mechanical and Electrical Activities after Gastrectomy

Segmental Ulcerative Colitis—Classification; Report of Nine Unusual Cases

Twenty-fourth Annual Convention
Los Angeles, California
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1. Kirsner, J.B., et al.: M. Clin. North America *41*:499 (March) 1957.

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Abstracted from The American Journal of Gastroenterology, Vol. 30, No. 6, Dec. 1958

COMBINED DRUG THERAPY IN GASTROINTESTINAL DISTURBANCES

INCREASED BENEFIT THROUGH DIMINISHED SIDE REACTIONS

JOSEPH BANDES, M. D.

New York, N. Y.

"In the course of treating gastrointestinal disturbances (most often peptic ulcer), it was noticed that several patients did not respond to the regimen as well as might have been expected. Investigation revealed the fact that although these patients generally adhered to the diet, the discomfort produced by the side reactions of the drugs induced them to stop medication entirely or to take it haphazardly."

MATERIAL AND METHOD

"Twenty patients (14 private and 6 clinic patients) were chosen who, in the absence of complications, had shown unsatisfactory response to a prescribed regimen of diet, anticholinergic, sedative (phenobarbital) and antacid. In addition to gastrointestinal symptoms, these patients all had in common varying degrees of emotional disturbances and they all had voluntarily stopped or interrupted their medication because of undesirable side-effects. These reactions were in descending order of incidence: dry mouth, blurred vision, drowsiness or beclouding of the mind, and interference with bowel and bladder function."

"In each case, the patient was started on tridihexethyl iodide with meprobamate in place of the previously administered anticholinergic-sedative combination, the diet and antacid remaining unaltered. The method of administration was the same as for the previous drugs; i.e., one tablet with each meal and one or two tablets at bedtime."

RESULTS

"... the results of treatment (Table II) with tridihexethyl iodide and meprobamate were excellent or good in 18, or 90 per cent of the cases and poor or questionable in 2, or 10 per cent. It will be noted ... that both of these patients were 'functional' cases."

No. of Patients	Response			Side Reactions			
	Excellent	Good	Poor or Questionable	Drowsiness	Dry Mouth	Other	Total
20	15 (75%)	3 (15%)	2 (10%)	2 (10%)	1 (5%)	0	3 (15%)

SIDE REACTIONS: 2 patients noted mild drowsiness and dry mouth, one patient dry mouth only. In no case were the symptoms severe enough to warrant diminishing the dose.

COMMENTS

"The encouraging clinical results of this investigation point up the fact that although poor progress is frequently due to poor patient cooperation, we can do much to improve this situation by recognizing the validity of the patients' complaints with respect to side reactions and then prescribing medication with a low incidence of unpleasant effects."

"Since this group of patients was chosen because of sensitivity to anticholinergic-sedative, statistical evaluation of side reactions to the medication used in this study is not feasible. The reduction from 100 per cent of side reactions attributable to the previously used medication to only 15 per cent with tridihexethyl iodide-meprobamate, however, is indeed noteworthy."

ILLUSTRATIVE CASE

FIG. 1—*X-ray (Case #17) at time of presentation (11 December 1957). P-A view showing large ulcer crater (arrow) on lesser curvature of stomach. Note also, small residue of barium in hiatus hernia.*

X-ray examination revealed a hiatus hernia (about one inch in diameter) and a large gastric ulcer (Fig. 1).

FIG. 2—*Same patient (18 March 1958). After 10 weeks' therapy (see text). Note complete disappearance of ulcer crater.*

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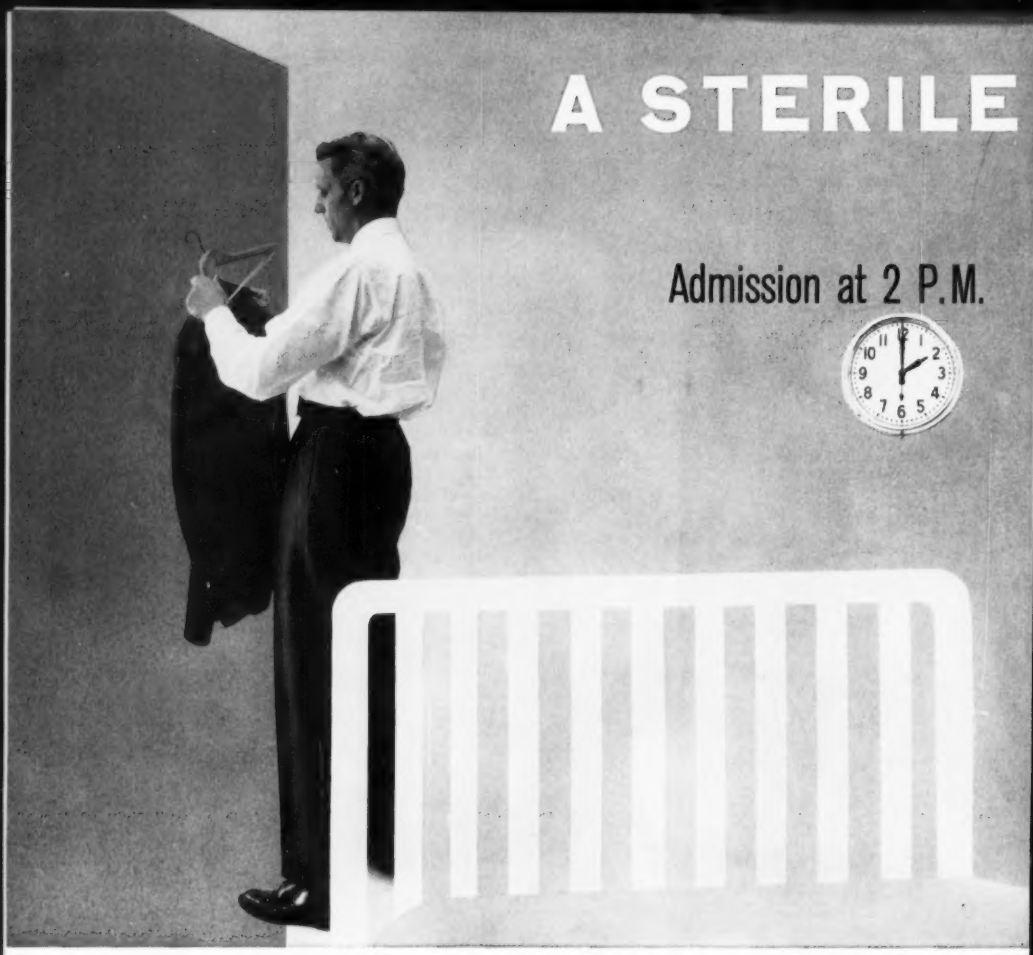

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1. Poth, E. J.: Intestinal Antisepsis in Surgery, J.A.M.A. 153:1516, Dec. 26, 1953.

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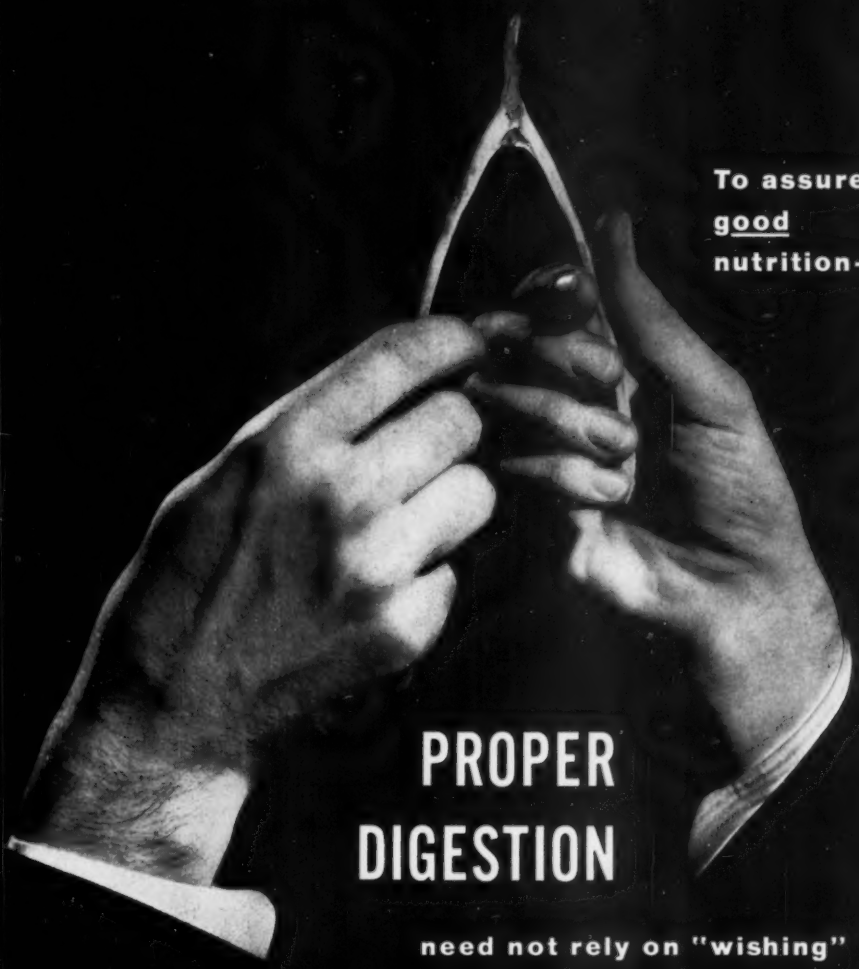

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1. Grayzel, H. G., Heimer, C. B., and Grayzel, R. W.: New York St. J. Med. 53:2233, 1953. **2.** Heimer, C. B., Grayzel, H. G., and Kramer, B.: Archives of Pediatrics 68:382, 1951. **3.** Behrman, H. T., Combes, F. C., Bobroff, A., and Leviticus, R.: Ind. Med. & Surgery 18:512, 1949. **4.** Turell, R.: New York St. J. Med. 50:2282, 1950. **5.** Marks, M. M.: Missouri Med. 52:187, 1955.

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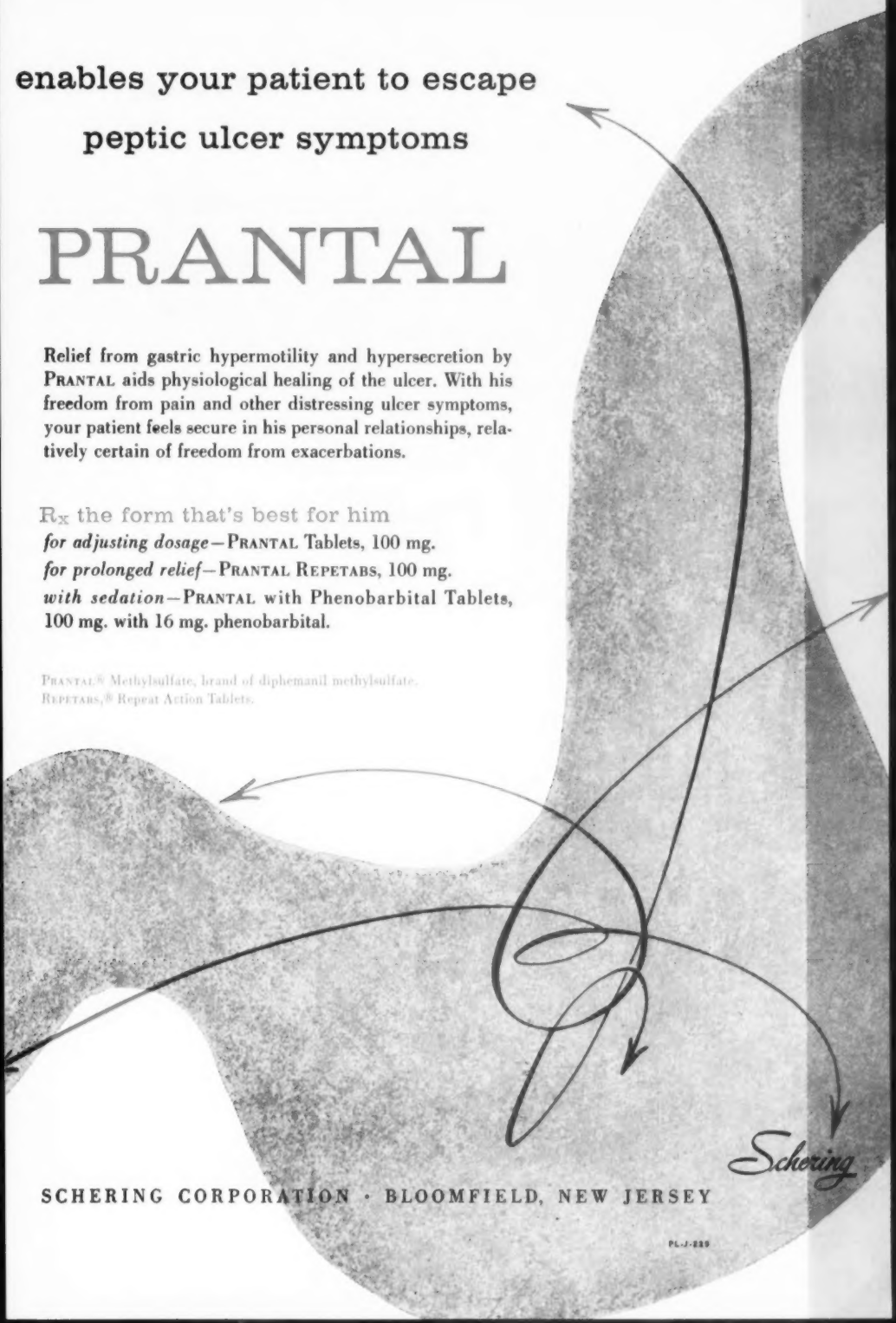

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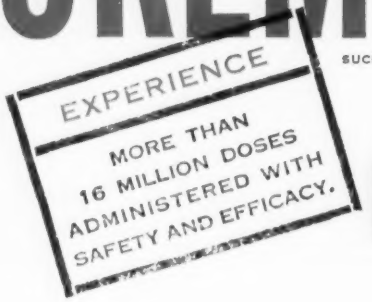

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Reference: Rosenblum, L. A.: Clin. Med. 6:73, Jan. 1959.

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**Source:* Lichtman, S. S.: Diseases of the Liver, Gallbladder and Bile Ducts, ed. 3, Philadelphia, Lea & Febiger, 1953, vol. 2, p. 1178.

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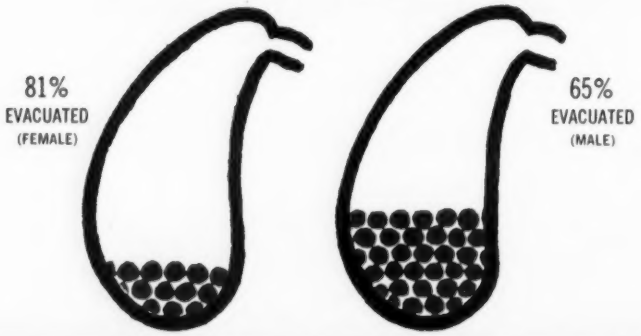

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VITAMIN K THERAPY IN LIVER DISEASE— NEED FOR A REEVALUATION*

F. STEIGMANN, M.D., F.A.C.G.
H. SCHRIFTER, M.D.
Z. D. YIOTSAS, M.D.
and
F. PAMUKCU, M.D.
Chicago, Ill.

Excessive bleeding has always been an enigma in patients with jaundice whether the icterus was due to extrahepatic obstruction or to parenchymatous liver cell damage. Discovery of Vitamin K deficiency by Dam as the cause of the bleeding in jaundiced patients led to a series of important contributions to the pathogenesis and therapy of this hemorrhagic tendency. It was soon noted that Vitamin K decreased the bleeding tendency in almost all cases in which an extrahepatic obstruction was the sole cause of the jaundice. Its efficacy, however, was less remarkable and constant in patients in whom liver disease was the predominant cause of the jaundice. This observation actually led to the so-called Vitamin K tolerance test as a differential diagnostic test between extrahepatic (surgical) jaundice and intrahepatic (medical) jaundice due to liver disease, on the assumption that in the former, the hypoprothrombinemia is due mainly to a deficiency in Vitamin K caused by faulty absorption because of absence of bile from the gastrointestinal tract and hence administration of this vitamin will result in a rise of the prothrombin to normal. In liver disease, however, the hypoprothrombinemia is due actually to a deficiency of prothrombin because of some lack of Vitamin K but more so due to the fact that the damaged liver cells cannot produce prothrombin precursor in sufficient amounts

*Read before the 23rd Annual Convention of the American College of Gastroenterology, New Orleans, La., 20, 21, 22 October 1958.

From the Hektoen Institute for Medical Research of Cook County Hospital, the Department of Internal Medicine, Gastroenterology and Therapeutics, Cook County Hospital and Department of Internal Medicine, College of Medicine, University of Illinois, Chicago, Ill.

even in the presence of Vitamin K and therefore, administration of Vitamin K may show little improvement in the hypoprothrombinemia.

At present, the status of Vitamin K in the therapy of patients with extrahepatic obstructive jaundice is not controversial. Its status in conditions associated with liver disease, however, is not as well defined and a number of controversial reports have appeared. In extrahepatic obstructive jaundice, the degree of jaundice correlates with the degree of hypoprothrombinemia and the need for Vitamin K, in cases with parenchymatous liver damage, however, the degree of jaundice is less important than the degree of liver damage in the determination of the presenting hypoprothrombinemia.

In general, it may be said that the status of Vitamin K in patients with liver disease is far from being completely clarified. A protective mechanism of Vitamin K for the liver has been reported by some[1] in animals before exposure to chloroform. Others, however, found that Vitamin K influenced only little the hypoprothrombinemia which developed in dogs following chronic chloroform intoxication[2]. Still others believed that Vitamin K may somewhat correct the hypoprothrombinemia in patients with liver disease, but would not otherwise compensate for the element of liver damage[3]. Observations to date, nevertheless, seem to indicate that Vitamin K is of some value in early cases of hepatitis, but of questionable help in cases of chronic hepatitis or cirrhosis.

Besides the chronological factor, the effect of Vitamin K depends also on the dosage factor, because larger doses of Vitamin K will occasionally result in a decrease of the prothrombin time when smaller doses have been ineffectual. Some also believe that the type of Vitamin K, water soluble or oil emulsion plays a role in the ultimate effect.

The hemorrhagic tendency in liver disease was at first considered to be due to a fibrinogenopenia. Later, this was proven incorrect and the prothrombin was considered the most important factor. Recently, however, it was pointed out that the hypoprothrombinemia as determined by the Quick one-stage method, may not be solely due to a deficiency of prothrombin, but may also indicate lack or deficiency of factor V (labile factor) and factor VII (stable factor). Only in cases of severe liver disease, does the hypoprothrombinemia indicate a deficiency in all three factors. In milder cases of hepatitis or in obstructive jaundice, the deficiency may involve predominantly only one factor, so that the differential determination may be both of prognostic and diagnostic value.

From the foregoing, it is apparent that a prolonged prothrombin time is usually an indication of Vitamin K deficiency and that Vitamin K therapy should be instituted. It is also apparent that in cases of extrahepatic obstructive jaundice without associated liver damage, the administration of Vitamin K will

result in a return of the prothrombin time to normal. In cases of liver disease, however, the administration of Vitamin K will lead to variable results. In milder cases, a slight or moderate hypoprothrombinemia may be improved by average doses of Vitamin K (10 to 20 mg.) parenterally per day. In more severe cases larger doses (70 mg.) per day might be of some help. The important thing to keep in mind is that the effect of Vitamin K is measurable within a few (four to eight) hours, and that it should therefore be determined within 24 to 48 hours. If no effect is noted at this time, the possibility of deficiency of factor V or factor VII or both should be considered and an attempt made to prove or disprove this assumption. If no facilities for determinations of these factors are available, then the patients should be given empirically, fresh blood for the treatment of the hypoprothrombinemia and hemorrhage tendency, since fresh blood improves the bleeding tendency due to lack of any of the three factors, prothrombin, factor VII or factor V.

It is our aim in this paper to discourage the unnecessary daily use of large doses of Vitamin K in patients with severe liver disease when there is no significant change in the prothrombin time, 24 to 48 hours after its administration, by stressing the possible danger which the use of large doses of Vitamin K may bring about in such cases.

Clinically, no toxic effects have been observed from the administration of Vitamin K and its analogues. Experimentally, however, massive doses of Vitamin K, when given to mice, produced injury to the circulating blood cells[4,5]. Aplastic anemia, respiratory depression and "acute vascular congestion" were also produced in experimental animals after massive doses of Vitamin K[6]. In dogs, Vitamin K in doses of 15 to 30 mg. per kilogram given intramuscularly, caused vomiting, albuminuria and porphyrinuria[7]. Moore and Sharman (1955) produced hemoglobinemia in Vitamin E deficient rats with massive doses of Vitamin K[8]. A hemolytic effect of very large doses (100 mg./kg.) of water-soluble Vitamin K in rats deprived of Vitamin E was also observed, Rose and Gyorgy[9] showing that Vitamin E deficiency in rats leads to an abnormally great hemolytic tendency. The toxic effect on red cells has been emphasized recently by Allison[10] who noted increased hemolysis in newborn premature infants given large doses of Vitamin K. About the same time, Laurance[11] observed a remarkable increase in the incidence of kernikterus in premature babies following an increase in the routine dosage of Vitamin K. In a retrospective survey, Crosse et al[12], found that there had been a steadily increasing incidence of kernikterus in premature babies which could be related to an increasing dosage of Vitamin K with its resultant increase in the bilirubin level.

Kernikterus of prematurity, in the absence of iso-immunization, was shown to be related to the level of bilirubin in the infant's serum[12-14]. There is little doubt that intramuscular Vitamin K in large doses causes some elevation of the serum bilirubin levels in the newborn baby; with poor liver function, the

added effect of the Vitamin K may just raise the serum bilirubin to a sufficiently high level to produce kernikterus of prematurity.

Warnings have been given to pediatricians and obstetricians about using unduly large doses of any water-soluble Vitamin K preparation in premature infants. The literature[15] contains reports of fatal hemolytic anemia occurring in two small series of premature infants following Vitamin K in one or more doses of 10 mg. No evidence of blood group incompatibility or Rh-factor problem was found. A Vitamin E deficiency factor in the hemolytic tendency has been noted also in humans. Thus Dju et al[16] report that the human fetus and infant tend to have small amounts of Vitamin E in tissues which may thus, be a predisposing factor to the untoward results of large doses of Vitamin K.

Too frequently, physicians have assumed that great overdosage of vitamins is innocuous. That this was unwise was demonstrated especially so far as parenteral administration of thiamine or nicotinic acid (niacin) was concerned. Some recent reports attempted to draw attention to upper limits for water-soluble Vitamin K in premature babies and in patients with liver disease[17]. There is no reason to fear harm from the long established dosage range up to 5 mg. in premature infants. Neither is there any reason to use a much larger dosage in either infants or adults.

The above reports are unfortunately not too well known to the general men, so that one still sees patients with cirrhosis, etc., who continue to get large doses (72 or more mg.) of Vitamin K daily for days and weeks, mainly because they had a high prothrombin time on admission. If a prothrombin time is repeated and found high, the dosage of Vitamin K might even be increased and the process goes on and on, causing the patient not only avoidable expense, but at times even possibly increased liver damage. Hence warnings about the use of Vitamin K are also necessary for other clinicians besides pediatricians and obstetricians.

Our liver study group has, in the past two years, investigated this particular phase in a large number of patients with liver disease of various degrees with the following results. In a group of 45 cases of cirrhosis (mostly Laennec's alcoholic type), the average initial prothrombin time was 34 per cent of normal. Twenty-four hours after 72 mg. of Hykinone parenterally, the average prothrombin time had risen to only 45 per cent and 48 hours later had dropped to 41 per cent. Eight of the 45 cases had a more severe hypoprothrombinemia 24 hours after the Vitamin K, and 12 had a similar effect 48 hours later. In 22 patients, the hypoprothrombinemia was more marked 48 hours than 24 hours after the administration of Vitamin K, indicating thus, that even if a slight rise in the prothrombin activity does occur within the first 24 hours, it is of short duration, usually disappearing after another 24 hours.

After the 48-hour determination of the prothrombin time following the administration of the 72 mg. Vitamin K (Hykinone) all patients were given 50

mg. (Mephyton) Vitamin K_1, parenterally and the prothrombin time was again determined 24 and 48 hours later, when the average was found to be 49 and 50 per cent respectively. Following Mephyton, too, there were 11 cases 24 hours later and 16 cases 48 hours later who had a more marked hypoprothrombinemia than on the preceding day, a finding which might support the exhaustion theory of Ungar et al[17].

A group of 19 patients suffering from severe liver disease, as evidenced by prehepatic or actual hepatic coma, had an initial average prothrombin time 30 per cent of normal. Twenty-four hours after the administration of 72 mg. Hykinone, it rose to 33 per cent and 24 hours after the administration of 50 mg. Mephyton, it was 31 per cent. Four patients had lower values of prothrombin 24 hours after the administration of Hykinone and seven patients had lower values after Mephyton, when compared with the initial examination.

Another group of 13 cases of milder cirrhosis had an initial average prothrombin time, 42 per cent of normal. Following 72 mg. Hykinone, the percentage rose to 69, 24 hours later and to 73, 48 hours later.

In another somewhat similar group of ten cases, the average initial prothrombin time of 39 per cent of normal rose to 66 per cent following 72 mg. of Hykinone.

In another four patients with moderate cirrhosis, the initial prothrombin time percentage of 43 rose to 65, 24 hours after 50 mg. of Vitamin K_1 (Mephyton), but dropped to 55, 48 hours later.

Comment

There are a number of reports in the literature in which the hazard of large doses of Vitamin K is discussed. Excessive amounts of Vitamin K have been found to increase the hypoprothrombinemia in patients with severe liver disease[18] as we similarly noted in a few of our cases. The further depression of the prothrombin level in some patients, following parenteral administration of Vitamin K, suggests that in these cases of hepatic disease, the liver appears to be functioning at its maximum capacity under the prevailing conditions. This depression may be the result of inadequate production of the substrate with which Vitamin K combines, or of abnormal utilization of the substrate with consequent interference with prothrombin formation.

The fact that in some patients with liver disease, there is either no response or even depression of the prothrombin level would speak for an exhaustion phenomenon in these particular instances.

It has been therefore suggested that patients with liver disease and hypoprothrombinemia should be given a small dose of Vitamin K. This dose should be repeated only if the prothrombin time does not show any further increase[17].

The only manner in which the prothrombin activity can be increased in patients with hypoprothrombinemia not responding to Vitamin K is by means of transfusion, preferably of whole, fresh blood or of frozen plasma.

It is possible that the increase in the degree of hypoprothrombinemia may not be associated with other decreases in hepatic function. Nevertheless, one cannot consider anything which decreases a specific hepatic function as innocuous and the clinician should therefore be on guard against this possible result of Vitamin K administration in patients with liver disease. It should become axiomatic among clinicians, that no response to the administration of large doses of Vitamin K within 24 to 48 hours may mean no further administration of Vitamin K. Moreover, in these patients, any sign of bleeding tendency should be combatted promptly with transfusions of whole, fresh blood.

Summary

In patients with liver disease, the hypoprothrombinemia does not improve significantly following the administration of even large doses of either Vitamin K (Hykinone) or Vitamin K_1 (Mephyton). Indeed, in some of them, a further decrease in the prothrombin activity may occur.

It is therefore advisable to determine the results of Vitamin K administration within 24 and 48 hours. If no improvement in the hypoprothrombinemia has occurred, then no further Vitamin K should be given, but the patient should receive whole, fresh blood, as a therapeutic measure against the hemorrhagic tendency.

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THE FREQUENT ASSOCIATION OF OTHER BODY TUMORS WITH FAMILIAL POLYPOSIS*

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An important concept has recently appeared in the medical literature that suggests a close diagnostic association between other body tumors and congenital familial polyposis. The presence of this familial colonic disease may often be suspected with the detection of other abnormal growths elsewhere in the human body. Such tumors may be situated in the soft tissues of the retroperitoneal, mesenteric or subcutaneous regions; or located commonly in the bones of the head. Such associated growths are fibromas, lipomas, fibrolipomas, epidermoid cysts, leiomyomata, desmoids, dermoids, osteomas, bony exostoses and fibrosarcomas.

Cripps[3], in 1881, described familial polyposis as being a development of multiple polyps in the large bowel. This pathologic entity is inherited, commonly appearing after puberty, and affecting 50 per cent of the individuals of succeeding generations. At onset, these numerous polyps of the colon are benign, but malignant changes usually develop in half of the individuals before reaching the age of 30 years. Tragically, most individuals, having familial polyposis, die from carcinoma of the colon prior to the age of 50 years, unless early adequate surgical treatment is instituted.

In contradistinction, Jeghers, McKusick and Katz[8], in 1949, described a further new disease, now known as the "Peutz-Jeghers' Syndrome". This pathologic entity is characterized by diffuse polyposis of usually the *small* intestine, that *rarely* undergoes malignant change[1]. Such individuals have associated characteristic and diagnostic mucocutaneous melanin spots on the lips and buccal mucosa in nearly every instance. Less frequently the pigment is seen around the other facial orifices and on the extremities. This disease is radically different from familial polyposis and must be differentiated from it. Seldom does one find other body tumors associated with the "Peutz-Jeghers' Syndrome".

Review of the Literature

Table I summarizes a review during the past 21 years of the salient points of 29 previously reported instances of a close association between other body tumors and familial polyposis. This table summarizes this information in the interests of both clarity and brevity. It is self-explanatory.

*Read before the 23rd Annual Convention of the American College of Gastroenterology, New Orleans, La., 20, 21, 22 October 1958.

TABLE I

REVIEW OF THE LITERATURE

Cases	Author Year	Age & Sex	Location of Secondary Tumors	Primary Lesion
1	Ref. 10 1937	23 F	2 yrs. postop. appearance, fibrosarcoma, desmoid-type, scar, L.L.Q. of abdomen.	F.P.; Ca. of rectum. Rx:—combined abdomino-perineal resection.
2	Ref. 13 1945	—	10 x 5 cm. area in mesosigmoid, fibrous tissue and perivascular lymphocytic infiltration.	F.P.
3	Ref. 2 1950	31 M	3 retroperitoneal leiomyomas in ileum.	F.P.
4 to 12	Refs. 4 and 6 1951 1953	— M & F	Subcutaneous tumors and cysts in all. 6 had bony tumors of mandible, maxilla and cranial bones.	F.P. with carcinomas of colon. All 8 died. All same family.
13 to 15	Ref. 12 1954	2-M 1-F	Multiple sebaceous cysts.	F.P., brothers and sister.
16 to 21	Ref. 11 1955	M & F	2—Desmoids of abdominal wall. 2—Fibromas of mesentery. 1—Osteoma of frontal bone. 1—Osteoma of femur.	F.P., all same family.
22 to 25	Ref. 14 1955	— 4 M	3—Osteomatosis and soft tissue tumors. 1—Osteoma.	F.P., all brothers.
26 to 28	Ref. 7 1956	—	Osteomas, fibromas, fibrosarcomas and epidermoid cysts appeared before symptoms of F.P.	F.P.
29	Ref. 9 1957	26 M	1947:—Subcutan. lipoma, back. 1951:—Ca. rectum, grade i, lipoma, ant. abd. wall. 1954:—2 lipomas, left loin and ant. abd. wall. 1956:—Fibrolipoma, large, base of mesentery.	F.P. 1951:—Abdominoperineal resection, 2 stage total colectomy. 1956:—Abd. exploration and biopsy of mass.

Note:—"F.P.":—Means Familial Polyposis.

TABLE II

NEW CASES REPORTED FOR THE FIRST TIME

Case No.	Year	Age & Sex	Location of Secondary Tumors	Primary Lesion
1	1932	31 M	Lipomas of scalp and ant. abdominal wall.	F.P., Ca. of sigmoid colon.
2	1938	25 F	Osteoma, rt. frontal bone. Lipoma, rt. hip region.	F.P., Ca. descending colon.
3	1938	45 F	Lipoma, rt. back. Fibroma, mesosigmoid.	F.P., multiple Cas. of colon. Died.
4	1941	26 F	Osteomas, l. parietal and mandible bones. Lipoma, ant. abd. wall.	F.P., Ca. of hepatic flexure.
5	1942	38 F	Fibrosarcoma, rt. femur. Leiomyomata of stomach.	F.P.
6	1944	22 M	Many sebaceous cysts, scalp and upper back.	F.P., Ca. of rectosigmoid. Died.
7	1945	31 M	Many subcutaneous fibromas.	F.P., Ca. of splenic flexure.
8	1946	35 M	Retroperitoneal mixed tumor. Sebac. cysts, scalp. Lipomas.	F.P., 3–Cas. sigmoid colon.
9	1947	20 F	Osteomas, rt. occipital bone and left maxilla.	F.P., Ca. transverse colon. 2 Cas. *in situ* in sigmoid colon.
10	1954	27 F	Exostosis, l. frontal bone. Lipoma, ant. abd. wall. Retroperitoneal lipoma, large.	F.P., Ca. of rectosigmoid. Ca. *in situ* in descending colon. Died.
11	1955	30 M	Sebac. cysts, upper back and arms. Many fibromas of trunk. Leiomyomata of ileum.	F.P., Ca. of left proximal colon.
12	1956	22 F	Exostosis, l. frontal bone. Fibrolipoma, mesoileum. Dermoid cyst, rt. ovary.	F.P., 3 Cas., l. colon and transverse colon.
13	1958	19 F	Many sebac. cysts, scalp, back. Lipomas, ant. abd. wall and loin.	F.P., Ca. of rectosigmoid. Ca. *in situ*, splenic flexure.
14	1958	32 M	Fibroma, back. Lipoma, ant. abd. wall. Osteoma, l. upper femur.	F.P., Ca. *in situ* in rt. midcolon.

Summary:—14 Cases. Period covered:—1932-1958. Av. Age:—27.4 yrs. Op. deaths:—3.
Six additional cases have since died after leaving the hospital.
5 additional instances of F.P. had no associated tumors, recorded in history.
19 instances of F.P. occurred in 239,478 consecutive hospital admissions.
Males:—6, Av. Age:—30.2 Years. Females:—8, Av. Age:—25.3 Years.

Report of 14 New Cases

Table II presents the essential facts of 14 new, previously unreported, instances of familial polyposis, that are associated with other body tumors. Medical hospital histories were searched for the past 25 years in assembling this data. These examples occurred in 239,478 consecutive hospital admissions. Five additional cases of familial polyposis failed to record in their clinical records the presence of other associated tumors. This gives an inaccurate clinical index as to the relative incidence of this association in hospitalized patients.

Comment

It does not appear to be simply fortuitous that familial polyposis is commonly associated with other body abnormal growths. The significance of this association is unknown at the present time. It may be that the explanation of this phenomena, as given by Gardner and Plenk[5], of a single pleiotropic gene, may be the correct one. Possibly, this association represents a genetic linkage between two dominants.

At present, and much more to the point, whenever the examining physician discovers multiple hard or soft tissue tumors upon physical examination of a patient, he is obligated to perform a proctosigmoidoscopy and obtain a roentgenologic barium enema, using the triple air contrast method, to exclude the possible unsuspected presence of precancerous familial polyposis.

Conclusions

1. Fourteen new instances of an association of various other hard and soft tissue tumors with proven congenital polyposis are added to the medical literature.

2. Twenty-nine other examples have been previously recorded in the available medical literature of the past 20 years.

3. Physicians are urged to remember the frequent association of these two pathologic entities and to rule out at the earliest possible moment the possible presence of an unsuspected instance of precancerous familial polyposis.

4. Under such circumstances, if two specific diagnostic tests are done (proctosigmoidoscopy and barium enema), many additional lives will be saved from needless deaths from the inevitable future development of carcinoma of the large bowel, arising in patients with unsuspected familial polyposis.

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Discussion

Dr. William Lieberman (Brooklyn, N. Y.):—I have been well repaid for getting up early to hear Dr. Collins.

He has noticed a possible correlation and, with his active mind and scientific curiosity, has gone into it in his usual thorough manner.

I should like to ask him, however, whether this correlation carries weight when it is statistically calculated, with percentages of possible error and deviation from the norm, and whether we can definitely, scientifically conclude there is such a correlation.

He has presented a number of cases of his own and others that would tend to indicate such a correlation, but do the statistics, in strict mathematical analysis, bear this out?

I should like to carry it a step further and mention that I have observed several cases, not of familial polyposis but of isolated polyps, and have noticed that these patients, too, frequently had other skin and mucous membrane growths. Many of them volunteer the information that they have nasal polyps, for example, and some of them show skin polyps, various types of cysts, and so on; in fact, when I tell a patient that he or she has a sigmoid or rectal polyp, the patient will often say, "Oh, yes. I have the same thing in my nose."

I am not offering this as indicating any sort of correlation, but my interest was excited by it, and I am trying to accumulate more similar cases.

It might be interesting for all of us, when we have a case of solitary polyp, or multiple polyps, as well as of familial polyposis, to inquire of the patient as to the existence of other neoplasms or polyps in the body and to search for them. There may be a correlation. At this time I could not hold forth that there is such, but it is an interesting point for further observation.

I want to thank Dr. Collins for his very excellent and mentally stimulating treatment of this subject.

Dr. H. B. Eisenstadt (Port Arthur, Texas):—I want to ask Dr. Collins if he has the impression that patients with malignancies of the colon due to familial polyposis have a better prognosis if these tumors are removed early than other people of the same young age group with the regular variety of colon cancer. If this would be the case it would be twice as important to investigate the cases with multiple skin, soft tissue and bone lesions for polyposis*.

Dr. Donald C. Collins (Hollywood, Calif.):—To answer my good friend, Dr. Bill Lieberman, we did submit these findings to the university, and they felt that since 14 were associated with tumors and 5 were not, there was no difficulty as to its statistical significance.

Then, too, I appreciate Dr. Lieberman's very kind remarks and also thank him for getting up early this morning.

Now, to answer our very eminent Governor from that great, but second largest state in the Union—Port Arthur, Texas—as to the prognosis in these conditions. It is bad. I told you three died in the hospital. There was a mortality of 65 per cent, so I think you will admit that the prognosis in these cases is poor if the carcinomas get going, and the time to take care of these is before malignant changes occur.

If you wait for carcinoma to develop, which it probably inevitably will, it is like locking the barn door after somebody steals the horse.

I think my friend, George Wharton, will probably agree with me it is best in these particular patients to operate as soon as the diagnosis is made, rather than gamble and run the risk of pathogenicity where the chances of malignant change are so terribly high, and the chance of dying from inoperable carcinoma is so great, because these are younger patients and the carcinomas are usually those with a high grade degree of malignancy, based on Broder's classification.

*Roberts, H. J.: Difficult Diagnosis, W. B. Saunders Co. Philadelphia, Pa. 1958, p. 322.

PRIMARY IDIOPATHIC SEGMENTAL INFARCTION OF THE GREATER OMENTUM*

A Collective Review and Report of a Case

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Primary idiopathic segmental infarction of the greater omentum is a relatively rare condition as evidenced by the fact that a careful review of the literature revealed only 42 authentic cases reported through 1956. The infrequency with which this condition is encountered, however, does not detract from its importance because when present it closely mimics several other acute abdominal emergencies, notably: acute appendicitis, acute cholecystitis, and perforated peptic ulcer.

To date, the diagnosis of primary idiopathic segmental infarction of the omentum has never been made preoperatively. This may be because this condition is seldom considered by the examiner in the differential diagnosis of the acute abdomen. It is important to keep this disease in mind whenever the acute abdomen is opened and the suspected organ found to be normal. This is especially true when serosanguinous fluid is encountered. In addition to the usual thorough exploration of the abdomen special attention should be paid to the omentum. Failure to carry out this part of the exploration has probably resulted in failure to establish the diagnosis of omental infarction in many instances.

Primary idiopathic segmental infarction of the greater omentum is a specific disease entity requiring the fulfillment of certain criteria before the diagnosis can be established. These criteria were set forth by Wrzenski, Firestone, and Walshe[32] in 1956. The establishment of such criteria has done much to relieve some of the confusion present in selecting authentic cases from prior reports. These criteria are: 1. The infarction must be primary in the omentum itself and not associated with pathology in the peritoneum or neighboring organs. 2. There must be no history of trauma to the abdomen which might account for localized infarction. 3. The infarction must be segmental and not

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associated with massive vascular occlusions involving large areas of omentum and/or adjacent organs.

A detailed review of the literature dealing with this condition has resulted in the elimination of many reported cases because of failure to meet the criteria listed above. Johnson[16], who has been given credit in the past for reporting the first authentic case of idiopathic omental infarction states that the omentum was adherent to the scar of an old hernial incision in the right groin and he considered the etiologic factors to be interference of the blood supply to the omentum by adhesions and to the sclerotic condition of the vessels present in his patient. Thus it will be seen that the first reported case of primary omental infarction does not meet the criteria listed above. Other cases[3,4,13,24,27] were

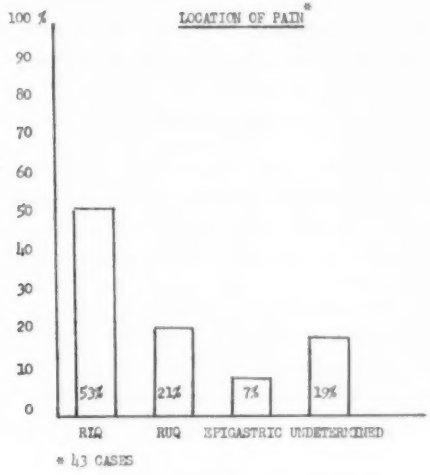

Fig. 1

eliminated because it appeared they were secondary to other conditions such as severe cardiac disease, portal vein thrombosis, trauma, and adhesions to the abdominal wall or other organs.

A total of 42 authentic cases were found in the literature. The largest series consisted of six personal cases each reported by Pines and Rabinovich[23] in 1940, and Shea, Pomer, and Spellman[28] in 1956. It is interesting to note that during the past 26-year period there has been a steady increase in the number of cases reported. From 1930-39 only one case was reported. Sixteen cases were reported in the ten-year period 1940-49. During the last six years 1950-56, 25 cases were described. This increase is probably due to greater awareness of this rather uncommon and obscure condition.

Etiology

The etiology of primary idiopathic infarction of the greater omentum is unknown; however, a number of etiologic factors have been suggested by various authors.

Eager and Barto[7] felt that the almost constant location of the infarct in the right lower portion of the omentum may suggest some anatomic peculiarity of venous drainage of the omentum as a cause of idiopathic infarction.

Harris, Diller and Marcus[11] believed that an extremely fatty omentum, by increased gravitational pull on the omental vessels, may act in conjunction with other factors to cause rupture of a vessel.

Hood and Geraci[15] presented a case of infarction which they believed resulted primarily from compression of the omentum in the space bounded by the liver, falciform ligament and anterior abdominal wall.

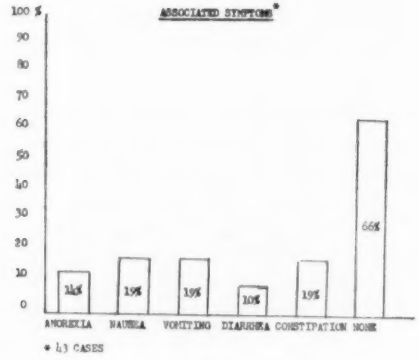

Fig. 2

Pines and Rabinovich[23] experimentally proved in rabbits that a forceful pull on the jugular vein of a rabbit would injure the endothelial lining and result in the formation of a clot at the site of injury. Furthermore, if the lumen of the vein distal to the site of injury was partially constricted so as to retard the flow of blood through the vein, thrombosis occurred more promptly. They felt that there was a striking resemblance to the thrombus thus produced experimentally to that seen in the infarcted omentum. In the light of such experimental findings, the authors believed that a possible stretching of an omental vein could lead to the formation of a thrombus.

Sinow[29] in defense of the idiopathic nature of the condition, stated that the thickness of the omentum obviates the possibility of torsion being the underlying etiology of infarction of so small an area.

Totten[31] has stated that in view of the close communication between the veins of the stomach and omentum, it is evident that strain on these thin-walled veins is definitely increased at the time of vascular congestion incident to a full meal. During this period he proposes that additional strain from increased intraabdominal tension as a result of sneezing, straining, coughing, or lifting may be sufficient to cause a primary rupture of the dependent veins of the omentum with hemorrhagic extravasation and secondary thrombosis.

It has been pointed out by numerous authors that there is no clinical picture typical of primary idiopathic infarction of the greater omentum. The preoperative diagnosis in the reported cases was acute appendicitis in 75 per cent, acute cholecystitis in 18 per cent, and perforated peptic ulcer in 7 per cent.

Case Report

A nine-year old white male child was admitted to the service of one of us (L.O.), at Mercy Hospital, New Orleans, La., on 5 July 1956, with the history of nausea, vomiting and constipation followed by sharp pain in the right lower quadrant of the abdomen of 24 hours' duration. Physical examination revealed a moderately obese male child, temperature 99.4° F, pulse 92, with right lower quadrant tenderness and guarding. Laboratory data revealed a total white cell count of 10,600 with 72 per cent polymorphonuclears. Urinalysis was negative. Preoperative diagnosis of acute appendicitis was made and the abdomen opened through a right rectus incision. An infarcted area of omentum without twist was immediately encountered in the right lower border of the omentum. The area measured 3 x 1.5 x 1.2 cm. and was not adherent to the abdominal wall or other structures. The appendix was found to be retrocecal and grossly normal. Resection of the omentum and appendectomy was performed. The patient made an uneventful recovery.

Review of the Literature

The clinical features of primary idiopathic segmental infarction of the greater omentum as derived from an analysis of the 42 reported cases and the new case reported above are as follows:

Sex:—Seventy per cent of the cases appeared in males, and 30 per cent in females.

Age:—Seventy per cent of the cases occurred between the ages of 20 and 55 years. Twenty-one per cent were less than ten years and 9 per cent were over 55 years.

Race:—There have been no reported cases in the colored race.

Symptoms:—The chief presenting symptom was abdominal pain. Out of the 43 cases only 36 provided any description of the pain. The pain was located

in the right lower quadrant in 53 per cent, right upper quadrant in 21 per cent, and in the epigastrium in 7 per cent. In 19 per cent of the cases the description of the pain was so vague as to preclude accurate localization. The pain remained localized from the onset in 77 per cent. In 19 per cent the pain was described as colicky, as sharp in 22 per cent, and as dull in 19 per cent.

Anorexia was present in 14 per cent, nausea in 19 per cent, vomiting in 19 per cent, diarrhea in 10 per cent, and constipation in 19 per cent. Anorexia, nausea, and vomiting was absent in 60 per cent of the cases either singly or in combination.

Physical findings:—Of the cases 68 per cent had a temperature elevation of 100° F or less. Tenderness occurred in 91 per cent, rigidity in 67 per cent and rebound tenderness in 38 per cent. The location of the tenderness and rigidity usually corresponded to the site at which the presenting pain was experienced.

Laboratory findings:—Total white blood cell count ranged from 10,000-13,000/mm.^{3} in 50 per cent, above 13,000 in 25 per cent and below 13,000 in 25 per cent. The total white count was not recorded in 3 of the 43 cases. The polymorphonuclear count was not recorded in seven instances but was 75 or over in 58 per cent of the remainder.

Operative findings:—Free fluid was found in the peritoneal cavity in 48 per cent of the cases. It was most commonly serosanguinous. The infarct was most commonly found in the right lower edge of the greater omentum, the size varying from 2 x 2 cm. to 12 x 10 cm.

Treatment:—All cases were treated by resection except one. Incidental appendectomy was performed in most cases.

Summary

There is no characteristic clinical picture of primary idiopathic segmental infarction of the omentum. In general, it mimics to a variable degree other acute abdominal conditions and indeed this variability and the lack of a clear clinical pattern may be the key to making, or at least suspecting, the diagnosis preoperatively.

If it can be said that primary idiopathic omental infarction presents any constant findings, it would be these: 1. Abdominal pain which remains localized. 2. Tenderness corresponding to the area in which the pain is experienced. 3. Absence of anorexia, nausea and vomiting.

To defer surgical treatment in favor of such a diagnosis would be hazardous; however, if the possibility of this disease is kept in mind, a definitive diagnosis may be made in some cases where no other disease process can be found.

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Discussion

Dr. Béla Halpert (Houston, Tex.):—I wonder whether the authors considered or looked for variations in the structure of the greater omentum in these cases. Variations are quite common and can be observed in individuals who are being x-rayed. The greater omentum has two parts to it, the gastrocolic portion and a free portion when the two layers of the omentum are fused. Complete fusion, however, is rare. If there is nonfusion of the layers the bursa extends between the layers of the greater omentum. Incomplete fusion may be either on the right side or on the left side. When the fusion is irregular the transverse colon makes a loop in the center and the omentum is fused to it.

Roentgenologically these variations can be detected if 24 hours after a barium meal, when the colon is outlined, a swallow of barium is given to outline the stomach. The distance between the greater omentum and the colon can then be studied. If the fusion is perfect the greater curvature of the stomach is parallel with the transverse colon. If there is nonfusion on one side the colon will sag on that side. If there is irregular fusion, sagging in the center of the colon is noted. If there is nonfusion the colon and the stomach can be separated without affecting each other.

I wonder whether anyone who has observed this idiopathic infarction paid any attention to these features of the greater omentum *(Am. J. Roentgenol.* 17:253-266, 1927).

Dr. J. E. Dugas, Jr. (Chalmette, La.):—In answer to Dr. Halpert's question, none of the authors noted any anatomical variation in the greater omentum. Most of the cases reported commented on the obesity of the omentum involved, in contrast to the cases of torsion of the omentum in which the omentum was thin and could be easily twisted, but so far as definite anatomic variations noted in the cases in the literature, I didn't find any.

THE VOLUME OF N/10 HYDROCHLORIC ACID NEUTRALIZED PER DAY IN THE TREATMENT OF PEPTIC ULCER*

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and

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As in all medical situations where a precise equation is impossible, no specific answer has yet written "*finis*" to the problem of peptic ulcer in the more than one hundred years since this disease entity was first described.

The many facets which have slowly evolved in these years of research, experiment and multiple theories have, even to the present, rendered the whole exasperatingly elusive of a universally satisfying solution.

Proffered solutions range from no drug therapy to continuous tubal drip, from rigid food selection to completely unrestricted diet, from psychiatric therapy to radiation and surgery.

The union of physical factors with those of the psyche has, in this disease, rendered inestimably greater a problem which would be sufficiently challenging were but one to be considered.

We, the authors, have reached our present thoughts on this subject slowly, over a period of many years; years during which our approach has evolved from employing, before 1944, routine peptic ulcer diets together with what we now recognize as but token medical therapy to our present belief that medical therapy must be sufficiently intensive to allow the patient to heal his ulcer while eating an unlimited diet.

We accepted the then-prevalent idea that we were fulfilling our duty to the ulcer patient if, during his periods of distress, we guided his diet along bland, nonirritating food lines and convinced him of the wisdom of adjusting to and accepting the fact that he must henceforth include his ulcer in his life pattern.

The idea that the production of excessively high hydrochloric acid should be countered with an equally excessive amount of neutralization did not occur until much later. We do not know why we thought it adequate protection merely to hold this acid "enemy" temporarily at bay with minimal amounts of neutralizing agents rather than to think in terms of healing the vulnerable area through neutralization sufficient to combat acid-peptic activity to a degree

*Read before the 23rd Annual Convention of the American College of Gastroenterology, New Orleans, La., 20, 21, 22 October 1958.

which would permit granulation tissue to form, remain in the floor of the ulcer and continue on to form the scar of a healed lesion.

As is so frequently the case, this principle was forced to our attention by chance. One of us, while a medical officer in the Army, discovered that the average ambulatory soldier suffering ulcer symptoms observed his limited diet practically only while it was supervised.

Whereas symptoms were controlled under supervised treatment on the post, those returning from periods away suffered recurrence of distress although therapy had remained the same. Obviously, the factor responsible was diet. The ingestion of liquids more irritating than milk and of foods less bland than pureed vegetables, eggs, etc. was too much target for our meager medical ammunition.

Thus, the germ of an idea which formed the basis for all of our subsequent work. Man was designed to consume all edibles in his environment and he should be able to do so. Foods do not cause ulcer but there is no denying that certain types are irritating to the *open ulcer*—therefore, should not the medical therapy be such as will affect the ulcer in a manner which will render it impervious to attack by any food? In other words, should we not attempt to arrive at a medical regime which would be commensurate with the emotional and physiological factors involving the patient? Should we not attempt a radical program of sedation to cope with the psychological pressures and of neutralization to assail the overabundance of hydrochloric acid? Should we not attempt to *heal* the ulcer?

One-half Hourly Neutralization

By 1952 all patients were taking half-hourly neutralization for 16 hours a day as well as two night treatments at two-hour intervals. Gastric extractions previously made "in the heat of the work day" (Fig. 1) an hour after a meal, milk, 100 mg. of a then commonly used anticholinergic drug or 40 gr. of aluminum hydroxide showed, in the patient with duodenal ulcer, a pH averaging 1.34, a pH incompatible with the accumulation of granulation tissue.

Few Healed Ulcers

The effective duration of treatment was found to be four and a half months in the majority of cases. We had previously discontinued therapy after three months but four observations resulted in the prolongation of this program.

1. In many instances patients suffered recurrences three to eight months after treatment which suggested that the original ulcer had not been healed and epithelized.

2. As 3,877 cases of peptic ulcer came under observation only 302 or 7.8 per cent had ever gone more than one year without symptoms while following

no special diet or medications. This we felt was strong evidence that conventional medical therapy consisted of too little, too infrequently, for too short a time to provide more than a transitory relief.

3. Relatively few cases (302) when seen by us the first time gave histories of being symptom-free more than a few months at a time, even those who had been receiving conventional, universally accepted therapy.

4. We were greatly impressed by the tremendous popularity of surgical treatment which we would like to attribute entirely to improved surgical skills and technics but which we reluctantly must assign to the fact that medicine was not offering the ulcer patient a solution to his problem.

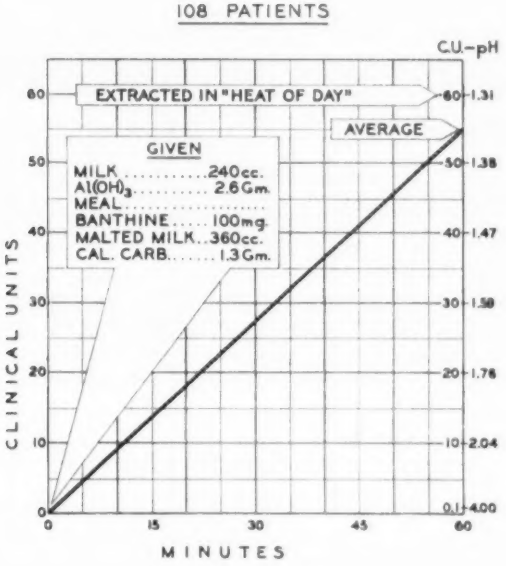

Fig. 1

As we took histories on 3,877 x-ray positive ulcers (Fig. 2) 992 or 25.6 per cent had hemorrhaged one or more times before being seen; 430 or 11.1 per cent when first seen had nonstenotic obstruction and 159 or 4.1 per cent had previously perforated. Complications had been encountered by 40.8 per cent and the rest had symptoms of uncomplicated ulcer.

Any system of therapy which permits the patient to suffer complication while being treated for ulcer or after treatment in 40.8 per cent of the cases is inadequate and it appears that our surgical colleagues are also rapidly swinging to this opinion.

X-RAY

Unfortunately, just the knowledge that his x-ray is negative does not relieve the digestive problems of the patient suffering classical ulcer syndrome.

While in no way deprecating the enormous value of roentgenograms, our experience demands that a word be said in warning against its "diagnostic infallibility". We have innumerable cases where x-rays have been negative or have shown a "healed" ulcer at a time when the patient was suffering a hyperacid syndrome.

The authors are now preparing a paper covering over 400 cases where patients, meeting all the criteria of peptic ulcer except for positive x-ray have,

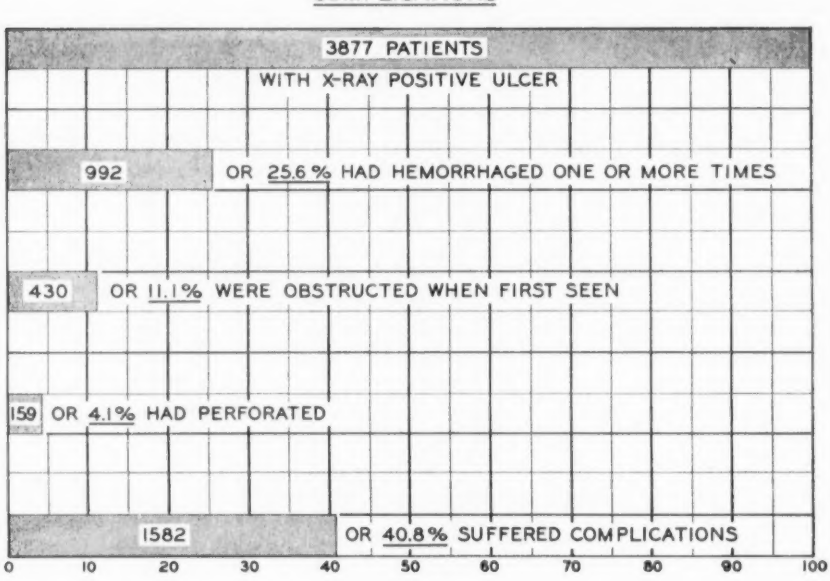

Fig. 2

on our routine medical therapy, responded in exactly the same manner and for approximately the same length of time as have those with x-ray evidence of ulcer.

At the present, we feel that 10-20 per cent of all peptic ulcers are undetected roentgenologically, dependent upon the equipment, ability and experience of the radiologist. Even with the best in equipment, training and experience, there are ulcers which just cannot be detected. In hemorrhage the percentage of negative gastroduodenal films rises.

Healed Ulcer

In this and in previously published papers dealing with this subject we have, understandably, reported on only x-ray positive peptic ulcer. Therefore, after over 12 years of following this concept, our criteria for healed ulcer:

Not a negative roentgenogram but a patient with a previously x-ray positive peptic ulcer who, upon completion of the intensive medical program outlined in former papers[1,2,3,4], was able to ingest a completely unrestricted diet for more than a year without symptoms and without taking any subsequent antacid medication.

Healing Ulcer

A patient who, 24 hours after initiation of a program of sufficient sedative, alkalinizing and adsorptive drugs is able to ingest a completely unrestricted diet without distress is presumed to have a healing ulcer. Naturally, in gastric ulcer we employ follow-up roentgenograms to exclude malignancy.

Proof of Healing

The very fact that the above conditions obtain during and upon termination of therapy seem to us incontrovertible proof that condiments, spices, roughage, "irritating" foods, tobacco and alcohol have no effect on the adequately treated peptic ulcer. That a person previously on a diet and in pain can enjoy any type of food without complaint is reassuring evidence that therapy is adequate, granulation tissue has been gained and that with maintenance of these two conditions for a sufficient period of time, a healed ulcer is inevitable.

Therapy

The therapy and its administration have been outlined in previous papers by one of the authors[1,2,3,4]. Here, however, we wish to emphasize the amount of N/10 hydrochloric acid which must, each day, be neutralized in the adequate treatment of peptic ulcer.

The amount of antacid or acid-adsorptive therapy may be said to be adequate if, in conjunction with an antacid-sedative-laxative or constipating agent, it:

1. Disintegrates in cold water in 30 to 60 seconds.

2. Does not furnish sufficient anticholinergic effect to mask an open ulcer.

3. Neutralizes 14 liters of N/10 hydrochloric acid (51 gm. pure hydrogen chloride) in 24 hours *in vitro* as measured by titration methods recommended in U.S.P.

4. Permits the patient to ingest an unrestricted diet without symptoms.

5. Is administered half-hourly for 16 hours a day, at bedtime, two and four hours after retiring.

6. Is administered without change of schedule for a period of four and one-half months.

Exceptions

Because the physiological and emotional factors productive of peptic ulcer differ in each patient it is readily understandable that the above outlined criteria do not apply in all patients suffering this disease. Through patients who never completed the recommended four and a half months course of treatment and those who never took the correct number of tablets, we have proof that healing will occur under less rigid therapeutic conditions in *some* patients. While 83.4 per cent of patients with peptic ulcer will heal on this rigid schedule the other 16.6 per cent require that 19.5 liters of N/10 hydrochloric acid or 71 gm. pure hydrogen chloride be neutralized each day and of the whole group 7.62 per cent are failures. The simple fact is that enough neutralizing material cannot be put into their stomachs to permit them to enjoy even periodic remissions. The exclusion of atropine in patients with glaucoma or those who develop atropine bladder, ileus or psychosis is, of course, necessary.

Those Requiring Intensified Therapy

The hemorrhagic and nonstenotic obstructive ulcers, in our experience, demand considerably increased neutralization, at least in the first day or two. These complicated cases are always given sufficient neutralizing material to eradicate 28 liters of N/10 hydrochloric acid (102 gm. pure hydrogen chloride) the first day after which period of time diminution of this intensive therapy is instituted.

Finally, the extremely important short-history gastric ulcer[5] must be considered malignant, treated in the same intensive manner as hemorrhage and obstruction, hospitalized until radiologically the lesion is absent or dramatically reduced. This, in our experience, occurs in from ten days to two weeks after which ambulatory treatment is maintained for four and a half months with follow-up x-rays as indicated. If there is doubt at the end of 14 days, surgery is recommended.

Comment

The experienced internist, recognizing the fact that patients suffering from peptic ulcer possessed the "ulcer personality" from an early age (probably from 4 to 6 years) which did not exhibit itself symptomatically, physiologically or radiologically until he was much older, does not relegate these people to a

lifetime of continued distress or diet. In fact, it is almost superfluous to observe that one of the classic features of the "ulcer picture" is the periodic remissions, seasonal or otherwise, which these individuals enjoy regardless of their attention to diet or medication.

Few perspicacious physicians believe that these patients are healed despite the negative roentgenogram which may obtain.

The experienced clinician evaluating histories of ulcer patients knows that a small group, approximately 7 to 8 per cent, enjoy completely symptom-free periods varying from one to four or more years while observing no dietary restrictions and taking no medication. These patients had, without question, healed lesions. He also recognizes that in some, healing was accomplished wherein no medical or surgical procedure was employed, by "accident".

One is also struck by the fact that most patients with "ulcer personality", a personality usually well established (as mentioned above) by ages 4 to 6, did not develop their ulcers until they had reached 19, 29, 39 or even 60 years.

In view of the foregoing, one must consider the possibility that adequately treated peptic ulcer may start laying down fibroblasts in the ulcer floor as early as a few hours after eradication of the acid and that, if this process be carried out over a sufficiently long period, the ulcer may be healed. It apparently happens after adequate gastrectomy if the "pituitary-adrenal axis" does not interfere.

Everyone is aware of the fact that omission of night therapy permits loss of granulation tissue. In our experience this may even happen in "drip therapy". Though prolongation of the time required for healing will result, it need not erase the chance for healing. A therapy must be employed which permits these unfortunate persons to work after they have recovered from their complications.

Statistics on hemorrhage, obstruction and short-history gastric ulcer are available[1,2,3,4,5]. In each of these complications as well as in simple peptic ulcer, this concept has been extremely rewarding.

As of 1 July 1955 we had seen 2,545 cases of peptic ulcer. We have thus far contacted 1,036 patients in this group who have enjoyed 34 or more months without hyperacid syndrome while taking no medication and eating an unrestricted diet. This is a larger figure than could be expected in an "accidental healing" group. Of these 1,036 only 446 have recurred; the remainder (590) have not recurred to this date. In terms of time the 446 recurred in an average of 34 months while 590 have not yet recurred in an average of four years and ten months.

It must be presumed that most of these patients have had a healed ulcer, that those who have recurred suffered a *new* ulcer for scar tissue withstands the

corrosion of acid better than normal tissue. Indeed many have changed locations from one side of the pylorus to the other.

Summary

1. A report is made on 3,877 peptic ulcers treated, using the concept that at least 14 liters of N/10 hydrochloric acid must be neutralized per day in order to inactivate the corrosive effects of acid in peptic ulcer for a period of more than four months.

2. It is pointed out that only 83.4 per cent of these cases were able to gain granulation tissue on this program and that 7.62 per cent could not be healed by any medical therapy.

3. The use of the roentgenogram as a criterion of the healed ulcer is felt to be inadequate.

4. Criteria are given for defining the healing and healed ulcer.

5. The merits of *unrestricted diet* in peptic ulcer are enumerated with reference to medical methods which permit its use.

6. The importance of approaching the problem of peptic ulcer in terms of amount of hydrochloric acid to be neutralized per day is accentuated, particularly in complications and short-history gastric ulcer.

7. The inadvertent healing of peptic ulcer in three categories is outlined.

8. Personal interview follow-up on 1,278 patients shows that most of this group remained healed three or more years and evidence is given which excludes them from a "healing by accident" group.

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Discussion

Dr. Louis Ochs, Jr. (New Orleans, La.):—I should like to make this comment. I know Dr. Marshall well enough to say this. I think that in Cleveland, especially around his office there are more people with ulcers than we have bed pans around Charity Hospital.

Secondly I am sure that patients who are allowed alcohol, who have an ulcer, even if they don't get well in a hurry, are certainly the happiest bunch of ulcer patients in the country.

Dr. William C. Jacobson (New York, N. Y.):—How about smoking?

Dr. Ochs:—He said he allowed alcohol and tobacco.

Dr. Edward A. Marshall (Cleveland, Ohio):—There has never been anything in favor of smoking elevating acid printed except the paper from Chicago some years ago—almost all papers agree that it doesn't make any difference. There was one paper out of Chicago which claimed it made a little difference, about so much, and if you used a filter on your cigarette it was a little bit less. Smoking means nothing in peptic ulcer.

Dr. Ochs:—If the patient is taking pills around the clock, he is not going to have much time to drink, anyway. (Laughter)

Dr. Marshall:—I have heard of pills washed down with beer; it is all right. They don't have any symptoms, so it is all right.

You know, we have been led into this diet idea by the patient, who has found something that disagrees with him because he is living with an open ulcer and he tells the doctor, and the doctor says, "That is not good for an ulcer patient," and finally he has a diet. The patient gets up in the morning and eats his breakfast and has a cigarette. On his way to the office he has two more. He gets to the office and doesn't feel well, and therefore he says that cigarettes are no good for ulcer, and that is the reason cigarettes have been eliminated, so far as I know.

Dr. Theodore S. Heineken (Glen Ridge, N. J.):—Suppose he misses some of his tablets—what do you do, provide an alarm clock so he will be reminded to take them?

Dr. Marshall:—There are clocks available which buzz in the pocket and warn the patient every half-hour; however, these people get "clocks in their heads". You know, 90 per cent of our patients we classify as anxious to please, and they will do almost anything for you. Some are sloppy and don't take tablets when they are told to take them. They are told: "You are starting your treatment today. Come back in two months and we will see," and we keep it going for six months and then say, "Now you are going to be discharged. You will get your ulcer back in two or three months. Maybe next time you will get religion."

USE OF HYPAQUE (BRAND OF DIATRIZOATE SODIUM) AS CONTRAST MEDIUM IN GASTROINTESTINAL EXAMINATION*

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Introduction

The use of Hypaque (brand of diatrizoate sodium) in gastrointestinal examinations is not a new procedure. Pirkey, Davis and Huang[1] performed a series of roentgenographic examinations with this medium on children in a Louisville hospital. They found that it could be used with greater ease in children due to lesser viscosity and ability to disguise taste. They found that it was nonabsorbable and nontoxic, and would produce no shock or irritation. Unlike barium, it contained no particulate matter. Small tracheoesophageal fistulas were demonstrated more frequently because of the lower viscosity. They were better able to visualize the pyloric segment in pyloric stenosis. It could be used in varying concentration (35 to 70 per cent) without unfavorable reaction.

While Hypaque is not the first iodine compound tried, it is the first water-soluble iodine compound used in this country. Moore et al[4], in England, demonstrated that a water-soluble iodine compound (Visciodal) could be introduced into the gastrointestinal tract with a Levin tube. Bleeding and perforating ulcers were identified. This method was used in enough cases (a series of 35) to assess its value either in perforation or bleeding. The ulcer niche was constantly demonstrated in bleeding gastric ulcers and duodenal perforations.

Jeffers, Samuels and Kjellberg[3] also demonstrated that Diodine, a water-soluble iodine preparation, previously used for arteriography and urography, could be introduced into the peritoneal cavity without harm.

Method

Two ounces (60 c.c.) of Hypaque mixed with a small amount of grape juice for flavoring only was administered to each of 38 patients on the gastrointestinal services of Touro Infirmary. Some had either previously had barium or received barium at a later date. Patients were examined both in supine and

*Read before the 23rd Annual Convention of the American College of Gastroenterology, New Orleans, La., 20, 21, 22 October 1958.

TABLE I

Case	Symptoms	X-Ray Findings Barium	X-Ray Findings Hypaque	Remarks
1. R.K. Age 59 WM	Burning pain in stomach on and off since 1950; sometimes relieved by food.	1950—Deformed bulb. No definite crater. 11/30/56—Deformed bulb. No definite crater.	4/6/56—Deformed duodenal bulb. No definite crater.	Satisfactory examination with Hypaque and barium.
2. K.B. Age 48 WF	Epigastric distress and loss of weight.	4/18/55—Questionable filling defect in base of bulb. 6/1/55—Polypoid thickening of folds of bulb.	3/12/56—Negative.	Advantage of barium over Hypaque in bringing out mucosal relief.
3. E.F. Age 42 CF	Pain in stomach, intermittently. 11 years' duration.	4/2/56—Deformed bulb. Pseudodiverticulum.	6/28/56—Markedly deformed bulb. Pseudodiverticulum.	Satisfactory examination with Hypaque.
4. O.M. Age 82 CF	Vomiting and epigastric pain 3 months.	10/29/56—Pyloric obstruction. Barium would not pass through the pylorus.	11/5/56—Hypaque passed through the pylorus and revealed an ulcer crater at base of bulb, or adjacent pylorus.	Advantage of Hypaque over barium in revealing ulcer crater and passing through stenosed pylorus.
5 K.V. Age 78 WF	Epigastric pain.	11/7/56—Gastric ulcer 1 c.c. in diameter, lesser curvature.	12/7/56—After medical therapy no ulcer crater revealed.	Ulcer, probably healed, not to be visualized with Hypaque.
6. A.B. Age 27 WM	Intermittent epigastric pain 6 mos.	11/21/57—Thickened rugal folds. Malrotation small bowel.	2/5/57—Thickened rugal folds. Malrotation small bowel.	Satisfactory examination with Hypaque and barium.
7. F.T. Age 58 WM	Pain in stomach, weight loss.	12/54—Prepyloric ulcer. Duodenal diverticula.	6/11/56—Prepyloric ulcer. Duodenal diverticula.	Satisfactory examination with Hypaque and barium.
8. A.M. Age 65 WF	Epigastric pain.	2/20/57—Small hiatal hernia.	4/22/57—Small hital hernia.	Satisfactory examination with Hypaque and barium.
9. L.B. Age 35 WF	Difficulty in swallowing and vague chest pain.	1954—Duodenal ulcer. Questionable prepyloric ulcer. 11/2/56—Duodenal diverticulum. No ulcer.	4/30/56—Duodenal diverticulum. No ulcer.	Satisfactory examination with Hypaque and barium.

TABLE I *(Continued)*

Case	Symptoms	X-Ray Findings Barium	X-Ray Findings Hypaque	Remarks
10. R.W. Age 35 CF	Nausea, vomiting, and abdominal pain.	7/10/56—Antral gastric ulcer, 4 cm. in diameter. 12/18/56—No ulcer crater.	10/9/56—No ulcer crater seen.	After medical management no ulcer demonstrated with either Hypaque or barium.
11. R.K. Age 65	Gastrointestinal bleeding.	Esophageal hiatal hernia. Hypertrophic gastritis of the fundus of the stomach.	Negative.	No ulcer demonstrated with either barium or Hypaque. Hiatal hernia and gastritis not demonstrated with Hypaque.
12. L.D. Age 66 WF	Feeling of fullness after eating.	2/14/52—Antral gastritis.	1/7/57—Antral gastritis. Deformed bulb.	Satisfactory examination with Hypaque and barium.
13. G.G. Age 64 WM	Epigastric burning.	10/25/56—Hiatal hernia. Thickened rugal folds. Irritable duodenal bulb.	10/25/56—Hiatal hernia. Thickened rugal folds. Irritable duodenal bulb.	*Strongyloides stercoralis* found on stool examination. Film studies with Hypaque were of comparable density to barium but fluoroscopically not as satisfactory.
14. G.G. Age 50 WM	Epigastric pain 3 yrs.	1953—Hiatal hernia. 1954—Hiatal hernia.	11/2/56—Hiatal hernia.	Satisfactory examination with Hypaque and barium.
15. G.T. Age 39 CM	Epigastric fullness 10 yrs.	2/27/56—Thickening of rugal folds. 9/13/56—Minimal deformity of the bulb.	4/13/57—Minimal deformity of the duodenal bulb.	Satisfactory examination with Hypaque and barium but air contrast unsatisfactory with Hypaque.
16. M.P. Age 42 WF	Nausea and vomiting.	2/19/57—Small hiatal hernia.	2/17/56—Negative.	Advantage of barium over Hypaque but hiatal hernias are not always visualized especially small ones (repair hiatal hernia 1942).
17. S.H. Age 64 CF	Epigastric burning.	9/16/56—Hiatal hernia, 2 cm. in diameter. Duodenal diverticulum.	Duodenal diverticulum. Hiatal hernia not demonstrated with Hypaque.	Disadvantage of Hypaque over barium in making out hiatal hernia and diverticulum.
18. I.W. Age 66 CF	Pain in stomach 5 yrs.	1952-1956—Negative.	11/19/56—Negative.	Satisfactory examination with Hypaque and barium.
19. R.S. Age 52	Indigestion. Pain over precordium. Diarrhea immediately after eating.	4/19/56—Mild antral gastritis. 5/8/57—Hiatal hernia. Mild hypertrophic gastritis. Irregularity of mucosal folds due to scarring.	5/5/57—Small hiatal hernia. Mild hypertrophic gastritis. Minimal scarring of prepyloric area.	Mucosal pattern not as well demonstrated with Hypaque as with barium.

TABLE I *(Continued)*

Case	Symptoms	X-Ray Findings Barium	X-Ray Findings Hypaque	Remarks
20. A.N. Age 51 WF	Abdominal pain and bloating.		5/18/57—Partial obstruction upper small bowel.	Adequate demonstration with Hypaque of loops of jejunum.
21. R.S. Age 50 WF	Dysphagia and indigestion.	Mild hypertrophic gastritis.	Diverticula of colon. Mild hypertrophic gastritis.	Diverticula of colon demonstrated with Hypaque but not with barium.
22. F.D. Age 63 WM	Pain in upper abdomen.		1/4/57—Negative.	
23. J.H. Age 43 WM			6/12/57—Gastrointestinal series with Hypaque fails to reveal the site of perforation in the gastrointestinal tract.	
24. G.G. Age 52 WM	Incisional hernia.	Normal gastrointestinal series.	Normal gastrointestinal series.	
25. E.C. WF	Pain in stomach for 3 mos.	7/19/57—Thickened rugal folds. Hypertrophic gastritis.	9/26/57—Negative.	Advantage of barium over Hypaque in bringing out mucosa relief.
26. A.P. WM	Pain in stomach. Vomiting intermittently 3 yrs.	10/8/57—Prepyloric scarring from old ulcer.	8/26/57—Prepyloric scarring from old ulcer.	Satisfactory examination with Hypaque and barium.
27. W.D. Age 1 mo. WM	Vomiting 2 days.		11/30/57—Narrowed pyloric segment. Operation for hypertrophic pyloric stenosis.	Excellent visualization of obstruction with Hypaque.
28. C.L. Age 19 WF	Vomiting, abdominal cramps 24 hours.		10/27/57—Hypaque administered and reveals localized obstruction proximal ileum.	Satisfactory demonstration of obstruction with Hypaque.
29. G.S. Age 33 WF	Epigastric pain.	2/3/58—Diaphragmatic hernia.	1/7/58—Minimal irregularity of distal esophagus. Stomach and duodenum negative.	Satisfactory examination with Hypaque and barium.

TABLE I *(Continued)*

Case	Symptoms	X-Ray Findings Barium	X-Ray Findings Hypaque	Remarks
30. A.M. WF	Epigastric distress. Occasional pain in region of the xiphoid process.	2/20/57—Diaphragmatic hernia.	Small diaphragmatic hernia.	Satisfactory examination with Hypaque and barium.
31. C.S. Age 49 WM	Indigestion and epigastric distress for 2 mos.	Small hiatal hernia. Mild hypertrophic gastritis.	Small hiatal hernia. Mild hypertrophic gastritis.	Satisfactory examination with barium and Hypaque.
32. J.S. Age 57 WM	Cramping sensation in lower abdomen. Active duodenal ulcer one yr. ago.	Negative.	Negative.	Satisfactory examination with Hypaque and barium.
33. R.M. Age 7 weeks WM	Vomiting after eating.		4/17/58—Pyloric stenosis with complete obstruction of the stomach.	Advantage of Hypaque in visualizing pyloric segment. Barium should not be administered at this age with history of vomiting because of danger of aspiration.
34. F.C. Age 53 WF	Epigastric pain following food ingestion.	Duodenal diverticulum.	Duodenal diverticulum.	Satisfactory examination with Hypaque and barium.
35. E.P.	Epigastric distress. Heartburn and indigestion after all meals.	Gastric ulcer, pylorus. Considerable scarring and deformity of the antrum.	Small diaphragmatic hernia. Considerable deformity in region of pyloric canal. Duodenal diverticulum.	Advantage of Hypaque over barium for visualization of duodenal diverticulum and diaphragmatic hernia.
36. J.R. Age 80 WF	Vomiting with fecal material 3 days. Distention and abdominal pain.		Markedly distended stomach and upper small bowel.	Satisfactory demonstration of obstruction due to incarcerated femoral hernia.
37. A.E. Age 40 WF	Indigestion. Nausea at times. Bloating.	10/29/57—Hypertrophic gastritis. Diaphragmatic hernia. Deformed duodenal bulb.	4/7/58—Normal esophagus stomach and duodenum.	Hernia not demonstrated with Hypaque.
38. R.L. Age 42 WF	Nausea and vomiting.	4/10/58—Hypertrophic gastritis.	4/12/58—Hypertrophic gastritis.	Satisfactory examination with Hypaque and barium.

Fig. 1—Flat plate of the abdomen taken 25 minutes after the oral intake of Hypaque grape juice mixture. This shows rapid transit of the contrast medium to the rectum.

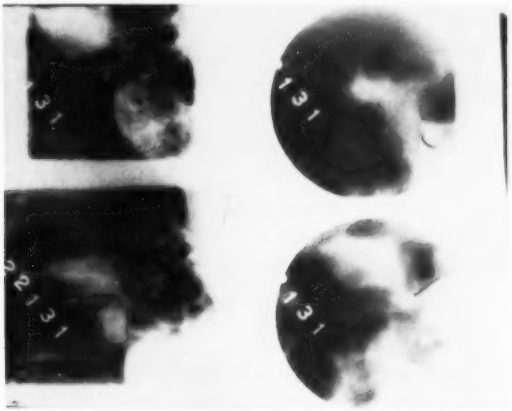

Fig. 2—A large ulcer crater near the base of the duodenal bulb and adjacent to the pyloric canal. The ulcer was not revealed with a routine barium meal due to obstruction at the pyloric canal, but the Hypaque solution passed through.

upright positions and the same technic used in barium studies was followed with the Hypaque. All who received this mixture found it palatable. Only a few complained of diarrhea which persisted for a period of 24 hours. None experienced any impactions or constipating effects such as occur occasionally with barium.

The above cases mentioned were not selected but chosen at random, all exhibiting some variety of gastrointestinal complaint.

Comment

In many cases Hypaque proved as effective as barium showing both *advantages* and *disadvantages*.

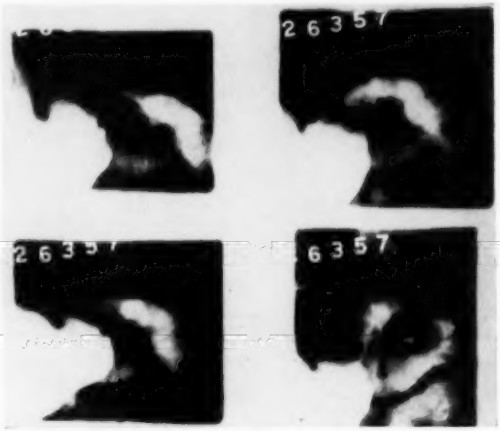

Fig. 3—A case of hypertrophic pyloric stenosis in an infant. Note the elongation and narrowing of the pyloric canal associated with a large filling defect consistent with hypertrophy of the muscle in the region of the pyloric canal. This case was verified at operation.

The *advantages* were as follows:

1. In cases of pyloric obstruction, stenosing ulcers of the pylorus, and hypertrophic pyloric stenosis, the Hypaque could more readily pass the narrowed and deformed pylorus and reveal the lesion (Cases 4 and 27).

2. Adequate demonstration of the site of small bowel obstruction was obtained with Hypaque (Case 20).

3. Avoided formation of fecal impaction in elderly people because of rapid transit time and solubility. This obviates long delay in diagnosis and makes surgical intervention possible in a shorter period of time.

The *disadvantages* were as follows:

1. Lack of adherence to the rugal folds of the stomach make it difficult to visualize the mucosal pattern. This same lack of adherence makes it impossible to obtain adequate double contrast films of the duodenal bulb.

2. Bitter taste unless disguised with a palatable agent; that is, grape juice.

Fig. 4—A small amount of Hypaque solution trapped in the prestenotic loop of small bowel in the case of acute intestinal obstruction. Fairly exact localization of the level of the obstruction was possible preoperatively.

3. Hiatal hernias infrequently demonstrated with Hypaque (Case 16).

4. Diarrhea of short duration is occasionally experienced with administration of Hypaque (Case 2).

5. Cost. Hypaque is much more expensive than barium.

Summary of Gastrointestinal Series Performed with Hypaque

Todate, Hypaque, mixed with grape juice, has been administered to 38 patients and a gastrointestinal series was then performed. In all of the cases examination with barium was also done. The solution of Hypaque was found to be palatable and the only reaction which occurred was the production of diarrhea. This, however, was in only a few cases.

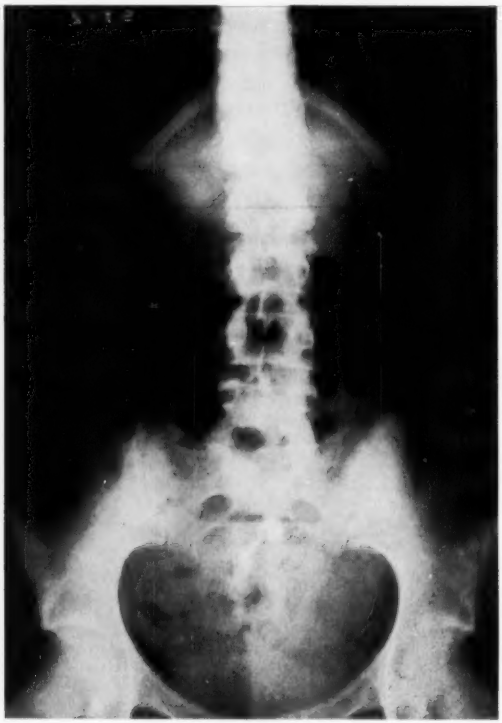

Fig. 5—Plain film of the abdomen shows suggestive findings of early intestinal obstruction with one or two mildly distended loops of small bowel with fluid levels.

Hypaque was found to be valuable in cases of pyloric obstruction. In one case, an ulcer crater was demonstrated at the site of the obstruction, whereas, only a few days previously, the barium mixture could not pass through the site of obstruction.

On the other hand, Hypaque was inferior to barium for routine gastrointestinal series. It will not outline the mucosal folds and its lack of adherence to the mucosa is a definite drawback during fluoroscopy. The use of gum-acacia

or starch would increase viscosity of solution and make possible demonstration of gastric and duodenal mucosal folds.

Acknowledgment

The authors wish to express their gratitude to Miss Joan Kristensen, secretary, Department of Radiology, Touro Infirmary, and to Mr. Stayton Dempsey, former Librarian, Charity Hospital of Louisiana, whose valuable help was needed in the preparation of this paper.

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Discussion

Dr. Josue Pagan-Carlo (New Orleans, La.):—Dr. Morrison said that the use of the barium meal is standard for the routine investigation of the gastrointestinal tract by means of x-ray; this is generally accepted. Another advantage of this Hypaque solution is in cases of intestinal obstruction in which the Hypaque, due to its rapid transit through the patient, can be given through a Miller-Abbott tube, and 15 minutes later the site of obstruction can be located. The Hypaque collects in the prestenotic loop of bowel and the surgeons have the advantage of knowing ahead of time where the obstruction is.

In other cases, for example, when the patient is being intubated due to intestinal obstruction; in the fluoroscopy we use a small amount of Hypaque to outline the duodenum and the duodenal bulb when the tube is in the pyloric canal; in this way we can direct the tube to pass into the duodenum. The Hypaque solution given the patient; if operation is performed does not present any particular kind of problem to the surgeon because it is a soluble compound and is not a suspension of insoluble particles like barium sulfate. Surgeons normally like to operate in a clean bowel, and if you give a patient with obstruction a moderate barium meal, you get the stomach and intestines full with barium; surgeons do not appreciate this.

GASTROINTESTINAL MECHANICAL AND ELECTRICAL ACTIVITIES AFTER GASTRECTOMY*

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Many efforts have been made to elucidate the causes of the so-called "dumping syndrome". Conflicting statements can be found in the literature on almost any aspect of this problem. Numerous theories have been advanced, and many suggestions made, for the prevention and management of the various symptoms grouped under this diagnosis. The purpose of this presentation is to

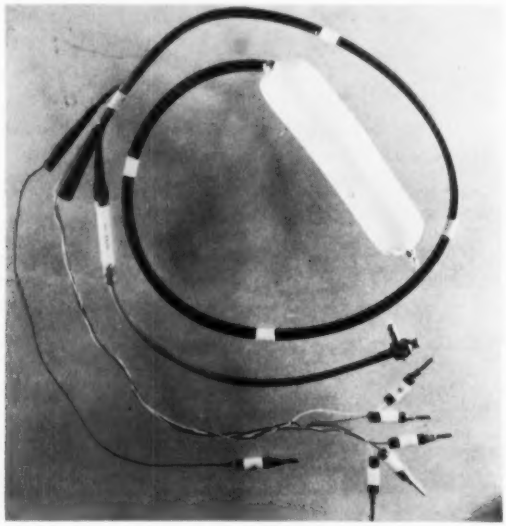

Fig. 1—Triple lumen tube with balloon and six electrodes.

call attention to certain mechanical and electrical findings in a group of 54 patients who underwent partial gastrectomy for peptic ulcer. This is an extension of a pilot study reported previously[1].

*Read before the 23rd Annual Convention of the American College of Gastroenterology, New Orleans, La., 20, 21, 22 October 1958.

From the Departments of Surgery and Medicine, Columbia University College of Physicians and Surgeons, New York. Aided by grants from N.I.H., Rothschild Research Gift, and James O. McCue Research Gift.

Material and Methods

This group of patients comprised 42 men and 12 women. Subtotal gastrectomy was performed 2 months to 21 years prior to the electrogastrographic studies. They all underwent gastric resection, 50 per cent or more, by standard technics as listed in Table I. Most of these operations were performed by members of the surgical staff of the Presbyterian Hospital. A few patients came from other institutions.

The methods for recording volume-pressure changes and the electrical activity of various sites of the gastrointestinal tract have been described previously[2].

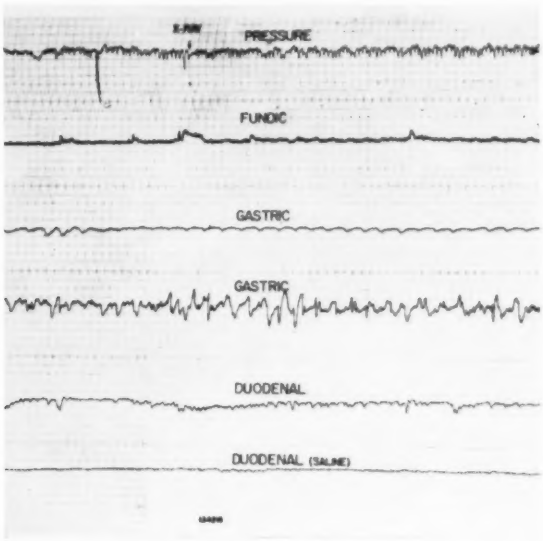

Fig. 2—Unit No. 13 42 15. Typical pattern recorded from asymptomatic patient.

A small rubber balloon is mounted on a triple lumen tube (Fig. 1). Five silver discs, 4 mm. in diameter are applied to the balloon in such a manner as to make a 1 mm. contact with the gastric or intestinal mucosa when the balloon is inflated. The electrode leads pass through one of the lumens. A sixth electrode consists of a chloridized silver bead contained in a small glass receptacle filled with saline and plugged with cotton. Electrical contact with the mucosa is made through this saline medium. The lead passes through a seond lumen. A larger but essentially similar type electrode is applied to the forearm. The potentials from several sites are simultaneously recorded with reference to this arm electrode. The balloon is inflated in the stomach or intestine with

TABLE I

DATA RELATING TO MECHANICAL AND ELECTRICAL ACTIVITIES

Case Number	Unit Number	Sex	Age at Time of Operation	Diagnosis	Type of Operation	Follow-up (Years)	Clinical Diagnosis of Dumping	Location of Balloon (% in)		Rhythmic Pressure Changes		Electrical Activity		EGG Interpretation	Comments
								Pouch	Intestine	3/min.	Less Frequent	Pouch	Intestine		
1	16 00 89	M	51	D.U.	H.H.	5	O	100	0	0	0	R	—	N	
2	16 44 57	M	55	G.U.	H.H.	3.5	O	50	50	0	0	R	R	N	
3	01 58 37	M	63	D.U.	H.H.	5	O	50	50	0	0	Sl IR	Sl IR	N	
4	99 11 28	M	52	D.U.	H.H.	8	III	60	40	0	ϟ	R	IR	D††	
5	94 62 13	M	77	D.U.	B.I. V.	0.2	O	100	0	0	0	R	—	N	
6	07 80 94	M	37	D.U. G.E.	H. V.	6	O	80	20	0	0	R	R	N	
7	135 80 33	M	50	G.U.	H.H. V.	0.2	O	80	20	ϟ	0	R	R	N	
8	135 12 52	M	47	G.U.	B.I.	0.2	O	100	0	ϟ	ϟ	R	—	N	
9	77 78 04	M	35	D.U.	P.A.	12	II	80	20	0	0	IR	IR	D††	
10	78 73 35	M	37	G.U. D.U.	P.	15	O	20	80	0	0	R	R	N	
11	23 03 90	M	44	D.U.	B.I. V.	0.9	O	80	20	0	ϟ	R	R	N	
12	95 73 98	M	45	D.U.	H.	5	II	30	70	0	0	IR	IR	D††	Laennec's cirrhosis
13	34 20 19	M	55	G.U.	H.	7	I	20	80	0	0	R	R	N	
14	74 17 97	M	57	D.U.	H.H.	4	O	50	50	0	0	R	R	N	Cholecystectomy
15	13 42 15	F	47	G.U.	B.I.	5	O	80	20	ϟ	0	R	R	N	
16	77 75 65	M	50 62	D.U. M.U.	P. V.	21 9	O	80	20	0	0	R	R	N	
17	92 31 33	M	43	D.U.	H.H.	8	O	60	40	0	0	R	Hyp. act.	N	
18	131 48 42	M	60	G.U.	B.I.	1	O	50	50	0	0	R	R	N	
19	30 64 31	F	36	G.U.	H.H. V.	1	O	50	50	0	0	R	R	N	
20	96 01 10	F	38	D.U.	B.I. V.	0.5	O	100	0	0	ϟ	R	—	N	
21	86 39 27	M	39	D.U.	H.H.	7	O	60	40	0	ϟ	R	R	N	
22	72 10 80	M	55	D.U.	H. V.	0.5	O	80	20	ϟ	0	R	R	N	
23	131 73 89	F	34	G.U.	B.I.	1	II	80	20	ϟ	0	R	R	N	

TABLE I *(Continued)*

DATA RELATING TO MECHANICAL AND ELECTRICAL ACTIVITIES

Case Number	Unit Number	Sex	Age at Time of Operation	Diagnosis	Type of Operation	Follow-up (Years)	Clinical Diagnosis of Dumping	Location of Balloon (% in)		Rhythmic Pressure Changes		Electrical Activity		EGG Interpretation	Comments
								Pouch	Intestine	3/min.	Less Frequent	Pouch	Intestine		
24	67 44 82	M	57	G.U.	B.I.	5	II	50	50	↑	0	R	IR	D↑↑	
25	71 63 39	M	41	D.U.	P.	15	O	50	50	0	0	R	R	N	
26	73 39 98	M	48	D.U.	P.A.	13	O	50	50	0	0	R	Hyp. act.	N	
27	20 88 90	M	61	D.U.	H. V.	3	O	50	50	↑	0	R	R	N	
28	133 87 77	M	68	G.U.	H.H.	0.2	O	40	60	0	↑	R	Hyp. act.	N	
29	95 13 85	M	72	G.U.	H.H.	5	I	40	60	↑	0	R	Hyp. act.	D↑	
30	03 52 94	M	37	D.U.	H.	7	O	40	60	0	0	R	R	N	
31	84 25 86	F	68	G.U.	B.I. V.	3	O	100	0	↑	0	R	—	N	
32	77 90 09	M	62	D.U. M.U.	H. V.	3	O	20	80	0	0	R	R	N	Stomal electrode hyper-active
33	11 67 19	M	74	D.U.	B.II.	6	O	80	20	↑	0	R	R	N	
34	88 76 85	M	48	D.U.	H.	2	I	20	80	0	0	Hyp. act.	R	D↑	
35	20 63 91	F	31	D.U.	H.H.	3	II	80	20	0	0	R	IR	D↑↑	
36	69 96 39	M	38	D.U.	B.I. V.	0.2	O	100	0	0	↑	R	—	N	
37	73 28 42	M	50	D.U.	P.A.	13	O	20	80	0	0	R	R	N	
38	70 44 88	M	40	D.U.	P.P.	15	O	60	20	0	0	R	R	N	Diabetes
39	27 32 74	M	44	D.U.	H.	2	O	60	40	0	0	R	R	N	
40	132 63 52	M	53	D.U.	B.I. V.	0.5	O	100	0	0	0	R	—	N	
41	21 62 58	M	37 42	D.U. M.U.	H. V.	5 3	I	20	80	0	0	R	R	N	
42	132 67 51	F	47	D.U.	H. V.	3	O	100	0	0	0	R	—	N	
43	89 13 44	F	65	G.U.	H.H.	7	O	40	60	0	0	R	R	N	
44	138 02 95	F	55	D.U.	H.H.	16	O	20	80	0	0	R	R	N	Cholecystectomy 1957
45	26 07 67	M	73	D.U.	H.H.	1	O	80	20	0	0	R	R	N	

TABLE I *(Continued)*

DATA RELATING TO MECHANICAL AND ELECTRICAL ACTIVITIES

Case Number	Unit Number	Sex	Age at Time of Operation	Diagnosis	Type of Operation	Follow-up (Years)	Clinical Diagnosis of Dumping	Location of Balloon (% in)		Rhythmic Pressure Changes		Electrical Activity		EGG Interpretation	Comments
								Pouch	Intestine	3/min.	Less Frequent	Pouch	Intestine		
46	60 81 91	M	57	G.U.	P.P.	18	O	50	50	0	0	R	R	N	
47	137 56 19	F	44	D.U.	H.H. V.	0.2	O	50	50	0	½	R	R	N	
48	26 97 37	F	64	G.U.	B.I.	2	I	80	20	0	0	R	R	N	
49	46 81 01	M	34	D.U. M.U.	P.	17	O	50	50	0	0	R	R	N	
50	17 69 74	M	51	D.U.	H.H.	4	O	60	40	½	0	R	R	N	
51	09 19 12	M	62	G.U.	H.H.	6	I	80	20	½	0	IR	IR	D½	
52	—	M	52	D.U.	H.H. V.	2	O	50	50	½	0	R	R	N	
53	84 81 15	M	45	D.U.	H. V.	5	II	50	50	½	0	IR	IR	D½½	
54	87 24 65	F	51	D.U.	H.	0.4	O	80	20	½	0	R	R	N	

Diagnosis:
D.U.—Duodenal ulcer
G.U.—Gastric ulcer
M.U.—Marginal ulcer
G.E.—Gastroenterostomy

Type of Operation:
H.H.—High gastrectomy with gastrojejunostomy—Hofmeister
H.—50% gastrectomy with gastrojejunostomy—Hofmeister
P.—50% gastrectomy with gastrojejunostomy—Polya
A—anterior
P—posterior
B.I.—Bilroth I
V.—Vagectomy

Clinical Diagnosis of Dumping:
O—Asymptomatic
I—Mild transient symptoms
II—Moderate symptoms
III—Severe, incapacitating symptoms

Electrical Activity:
R—Regular rhythmic activity
IR—Irregular rhythmic activity
Sl IR—Regular rhythmic activity mixed with brief periods of irregularity

Electrogastrographic Interpretation:
N—No suggestion of dumping
D½—Abnormal record, at times resembling the dumping pattern
D½½—Markedly abnormal—considered characteristic of "dumping"

approximately 100 ml. of air through holes in the third lumen. It is then connected to a Statham gauge for recording intraluminal pressure changes. The electrical output of the Statham gauge is likewise recorded simultaneously with the electrogastrogram by means of a modified six channel Offner recorder.

The location of each electrode was established radiologically. In the intact stomach two types of electrical potential are recorded[2]. With the chloridized silver electrodes and the saline junctions both in the stomach and on the forearm a steady potential is recorded corresponding to what is commonly referred to as the D.C. potential. The normal gastric mucosa is always negative with respect to the skin. The recording, in addition, presents a rhythmic change of potential that is referred to as the A.C. potential. When recorded from the lower

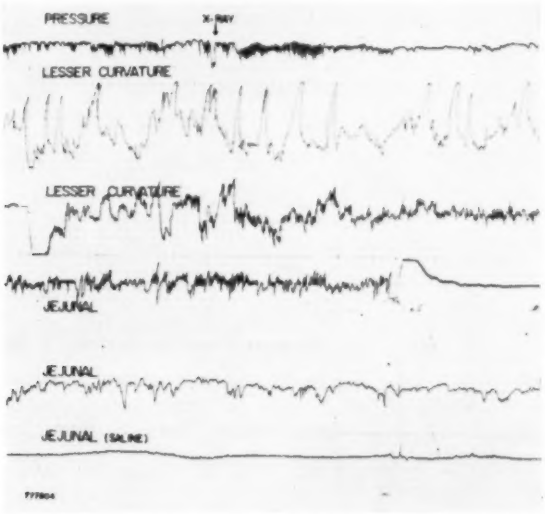

Fig. 3—Unit No. 77 78 04. Typical pattern recorded from a patient with dumping symptoms.

half of the stomach it shows waves at a rate of 3 cycles per minute. In the fundus it is usually much faster, 18 to 20 waves per minute. Similiarly, the duodenum and jejunum have a rhythmic potential at a rate of 18 to 22 per minute[2-5].

Although there are many gaps in our knowledge as to the significance of the gastric and intestinal electrical activities it is generally accepted that the D.C. potential corresponds to mucosal activity and can be influenced by anoxia and drugs that affect the secretory activity of the mucosa. The A.C. potential probably corresponds to the neuromuscular activity of the gastrointestinal tract. The pressure recordings represent volume changes caused by a composite of

both intra- and extraluminal factors. Respiratory changes and other artifacts can be isolated from changes due to gastric or intestinal activities but such a large balloon, inflated with 100 ml. of air, gives only gross information as to such activities. When rhythmic changes of 3 waves per minute are observed, it is fair to interpret them as created by gastric peristalsis. In most patients the balloon carrying the electrodes entered the duodenum or the jejunum to various distances. Radiological estimates of the distribution of the balloon between the gastric pouch and the small intestine were noted.

Results

Data relating to mechanical and electrical activities in this group are presented in Table I. Since criteria for the diagnosis of dumping have not been

TABLE II

Summary of Clinical Diagnosis and Electrogastrographic Interpretation

Clinical Diagnosis	Electrogastrographic Diagnosis			
	N	D†	D††	Total
Group O	41	—	—	41
Group I	3	3	—	6
Group II	1	—	5	6
Group III	—	—	1	1
Total	45	3	6	54

standardized we have adopted a classification similar to those of Pulvertaft[6] and Saikku and Halonen[7]. The patients are classified in 4 groups:

Group 0:—Patients who have become essentially asymptomatic within one month after partial gastrectomy. They may have had a few distressing experiences when normal feeding was resumed but have made rapid adjustment to regular meals.

Group I:—Patients who have had minor dumping symptoms for a somewhat longer period (more than one month) or who had to forego certain foods in order to avoid postprandial distress.

Group II:—Patients with mild to moderate symptoms, having persisted for months or years, often relieved by lying down. Such symptoms have compelled the patients to make many adjustments in their ways of eating, resting after meals, or other changes in order to avoid or control the numerous symptoms.

Group III:—Patients who have become incapacitated to the point of needing continuous care.

Figure 2 represents a typical pattern of mechanical and electrical activities seen in patients who belong to group 0. This patient underwent subtotal gastrectomy with gastroduodenostomy for gastric ulcer four years prior to this study and has remained asymptomatic. The pressure recording shows the respiratory artifacts and a rhythmic change at the rate of 3 waves per minute. This is fairly synchronous with the typical 3 per minute electrical waves recorded best with the electrodes labelled "gastric". Note the faster electrical waves in the fundus and in the duodenum. This type of regular pattern was seen in recordings classified as group N (nondumpers).

Figure 3 shows a typical recording obtained in patients who had various degrees of the dumping syndrome. Note the marked irregularity of the electrical activity as recorded from the stomach and the small intestine.

In both groups, the electrical patterns observed were not influenced by vagectomy, location of the ulcer or the type of anastomosis. Rhythmic pressure changes were observed in patients in both groups even in some with vagectomy.

Table II, summarizing the data, shows good correlation between the clinical diagnosis and the electrogastrographic interpretation.

Comment

The findings in this group of 54 patients indicate a markedly abnormal electrical activity of either the gastric pouch, the small intestine, or both, in patients with symptoms considered to represent the dumping syndrome. Attention is therefore called to the possible role of either inflammatory processes or disturbed function of both the gastric remnant and the anastomosed portion of the small intestine. A great amount of additional work is needed in order to assess the various conclusions of numerous authors as to the behavior of the gastric pouch and the small intesine. A few of these unanswered questions will be reviewed in the hope of stimulating research in this field.

Is the gastric remnant an inactive conduit[1,8] incapable of producing peristaltic waves or does the pouch assume gradually both reservoir and peristaltic functions as suggested by our findings of pressure volume changes with a 3 per minute rhythm?

Does the gastric emptying play a role in the development of dumping symptoms? Do the "dumpers" dump? Do they flood the small intestinal tract at a much faster rate than patients without these distressing symptoms? Or do all gastrectomized patients distribute the ingested food at a similar rate? With similar emptying time, are the symptoms a function of the tolerance of the small intestinal tract to the partly digested food and all subsequent changes

in the intestinal contents? Or are the symptoms a function of extraintestinal processes?

In reviewing the abundant literature of the past 45 years one can find data to support opposing answers to all these questions[1,6-14].

The present electrogastrographic studies indicate an abnormal behavior of the gastric pouch and of the adjoining small intestine in patients who present the "dumping syndrome". The nature of these local changes needs further investigation.

Summary and Conclusions

The electrical and mechanical activities of the gastric pouch and the adjoining duodenum or jejunum were studied in 54 patients who underwent partial gastrectomy for peptic ulcer.

Asymptomatic patients have regular electrical waves, whereas patients with the dumping syndrome present erratic electrical activity. These findings may reflect the functional differences between the two groups of patients.

Rhythmic pressure changes at a rate of 3 waves per minute were recorded from the gastric remnant in 15 patients.

Acknowledgment

The authors acknowledge with thanks the technical assistance of Miss Carolyn Dangler and Mr. J. Meyer.

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Discussion

Dr. M. E. Steinberg (Portland, Ore.):—Every approach to this complicated problem is important. I wonder, however, if we all speak the same language when we talk about "dumping".

Personal experience with remedial operations on 56 patients who have undergone a sum total of 160 gastric operations presents convincing evidence that a number of symptoms which are frequently attributed to dumping are not at all due to the effects of precipitate passage of gastric ingesta on the efferent small bowel loop.

The term "dumping stomach" was first used by Mix in 1922. He reported a case history of a female patient who since her gastroenterostomy complained of nausea and vomiting followed by pain in the epigastrium and in the left hypochondrium. The vomitus consisted of bile and mucus. These attacks always came on about midnight and lasted a half an hour or so and then disappeared. The pain radiated from right to left and up the left shoulder. Vomiting gave some relief. The patient also induced vomiting by taking bicarbonate of soda. The Rehfuss tube, which was kept in the stomach for four hours, failed to produce "a single drop of fluid". Again quoting from Mix's original paper, "This did not coincide with her story of vomiting of food, and it was apparent that the test meal had passed clear through her stomach." Also as soon as the barium was swallowed it passed from the stomach into the bowel. The patient ceased vomiting after the gastroenterostomy was dismantled. According to Mix the precipitate evacuation of the barium swallow from the stomach into the intestine through the gastroenterostomy "disclosed the diagnosis and the whole story". He concluded that his patient suffered from a "dumping stomach". Since then the term "dumping stomach" has become widespread among clinicians.

These symptoms recorded by Mix which were experienced by his patient with a gastroenterostomy cannot, however, be identified as those which are characteristic of dumping malfunction in spite of the precipitate evacuation of the barium swallow. The case history reported by Mix is clearly diagnostic of one of the mechanisms causing reflux. Since the bilious vomiting in Dr. Mix's patient always came on at night, it is likely that the recumbent position facilitated copious reflux into the gastric pouch of stagnant duodenal secretions from an over-distended duodenojejunal loop.

Dr. Colcher and his associates have made a most worthwhile contribution. This, however, is only one facet of a perplexingly complicated problem.

In discussing the phenomenon of dumping it is well to recall the following quotation from Hamlet:

"There are more things in heaven and earth, Horatio, than are dreamt of in your philosophy".

Dr. Henry Colcher (New York, N. Y.):—Thank you, Dr. Steinberg. I am sure it is extremely important to define what is "dumping". In the paper we give the classification of "dumping" as it was more or less accepted, I believe, among the Scandinavians and British.

Basically, the "dumpers" are patients who, following gastrectomy continue to present, even after two to three months, symptoms; such as epigastric fullness, various types of abdominal discomfort and vasomotor changes, namely, perspiration, tachycardia or other numerous functional symptoms. These manifestations will disappear when the patient lies down or by restricting certain foods, whether in quality or in quantity.

I believe, this kind of classification will eliminate all people who have various postgastrectomy symptoms but who do not present the "dumping" syndrome.

Only a week ago, we had an unusual case of a woman with persistent diarrhea that started about two years after gastrectomy. She was sent to the clinic with the diagnosis of "severe dumping". Actually this patient had functional diarrhea not related to meals and should not have been called "a dumper".

This proves that Dr. Steinberg's point is important. The criteria should be established and people should discuss the same type of disease when "dumping" is discussed.

SEGMENTAL ULCERATIVE COLITIS—CLASSIFICATION; REPORT OF NINE UNUSUAL CASES

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INTRODUCTION

The term "segmental ulcerative colitis" heretofore has been applied to cases of ileocolitis—involvement or retrograde involvement of the terminal ileum[1-7]. We believe that the term segmental ulcerative colitis is applicable only to those cases in which the disease, when first diagnosed, is restricted to a segment or to a portion of the colon. This definition excludes conditions in which the rectum or ileum is involved and ileocolitis. This terminology differs from that of others[1-7], who include in their series some cases of ileocolitis and some cases with retrograde involvement of the terminal ileum.

Neuman, Bargen and Judd[1], in a review of 201 cases of segmental ulcerative colitis, included 45 cases (22.4 per cent) in which there was retrograde involvement of the terminal ileum. Manning, Warren and Adi[3] also excluded all patients with involvement of the rectum, but included patients with secondary involvement of the terminal ileum of a "lesser extent than that of the colon". In their series of 25 patients, 76 per cent had involvement of the terminal ileum.

Yarnis, Marshak, and Crohn[6] have shown that in the syndrome of ileocolitis there is concurrent involvement of the terminal ileum and colon in a nonspecific or granulomatous process. They state: "It therefore appears that regional ileitis may be associated with ulcerative colitis or 'granulomatous' [segmental] colitis. . . . the combinations of the two diseases may take place simultaneously (synchronous) or may occur in sequence (metachronous)." They further point out that "although the granulomatous nature of the lesion in the ileum could be identified fairly accurately, it was difficult to determine radiologically whether the alterations in the colon were ulcerative or granulomatous in nature."

The pathology of segmental ulcerative colitis has been studied by Neuman and Dockerty[2], who have shown that "microscopically the lesion is nonspecific

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subacute and chronic granulomatous inflammatory process involving the entire thickness of the wall. . . . Gross mesenteric lymphadenopathy is seen only occasionally and it is never marked. Focal granulomas are present in the mesenteric lymph nodes, but the granulomatous nature of the lesion is not as uniformly apparent nor as marked as in the wall of the intestine."

We believe that the terminology of these entities should be clarified. Therefore, we propose the following:

A. Those patients who have ulcerative colitis primarily, but who have minimal (backwash) ileitis should be classified as having *chronic ulcerative colitis with involvement of the terminal ileum.*

B. Those patients who have regional enteritis primarily, but with extension to the colon, should be classified as having *regional ileitis with secondary colitis.*

C. The indeterminate group, for which it is not possible to discover whether the disease either started or is more severe in the small or the large intestine, should be classified as having *ileocolitis.*

D. Those patients who when first seen have disease in only a segment of the colon and none in the terminal ileum or the rectum should be classified as having *segmental ulcerative colitis.*

Use of the foregoing classification by clarifying the disease in terms of the extent of involvement can be helpful in interpreting published reports. In addition, the classification can be of help in evaluating results of treatment reported and in prognosis. For example, our patients who have ulcerative colitis without involvement of the ileum have a better prognosis than those with "backwash ileitis"; those who have regional ileitis without involvement of the colon have a better prognosis than those with extension to the colon; and those who have ileocolitis have a poor prognosis.

It is the purpose of this paper to review the literature briefly and to report on nine patients with true segmental ulcerative colitis as we have defined it. The aspects that we discuss are: 1. the incidence of this condition; 2. the response to medical and to surgical treatment; 3. whether the unusual segmental type in time becomes universal, involving the entire colon and rectum; and 4. whether, when surgery is indicated, local resection of the diseased segment is sufficient, or whether total colectomy is necessary for cure.

Incidence

True segmental ulcerative colitis is rare. According to the records of patients with ulcerative colitis examined at this clinic from 1940 to 1958, nine patients have had disease that satisfies our definition. During that period approximately 150 patients with ulcerative colitis were operated upon and over 1,000 patients with chronic ulcerative colitis were observed. The incidence of segmental colitis at this clinic is considerably lower than that reported in the

literature. We believe that this discrepancy is due to our rigid definition of the term and strict adherence to the definition. Cases in which involvement of the terminal ileum was questionable (and such involvement occurs frequently in cases of right-sided colitis) were excluded.

Summary of Cases

Case 1:—A 43-year old man developed severe, persistent, cramping pain in both lower quadrants in March, 1953. Stool examinations and findings on proctosigmoidoscopy to 9½ inches were normal. Roentgenograms made after barium

Fig. 1—Case 1. Segmental colitis involving a portion of the descending colon (barium enema). There was no recurrence during the five years after segmental resection.

enema showed evidence of spasm, and an irregular outline and distortion of the mucosal pattern of the descending colon, suggesting inflammation. A segmental resection with a primary end-to-end anastomosis was done. The pathologic findings were severe, localized, chronic ulcerative colitis, segmental in type; the tissue at both lines of resection was free of disease (Fig. 1).

An interview in February, 1958 (59 months after surgery) indicated that the patient has been entirely asymptomatic and has one or two stools a day. During the five years this patient has been followed, the colitis has not recurred.

Case 2:—A 44-year old woman was examined first in February, 1946. She had intermittent episodes of bloody diarrhea since 1935; in that year a diagnosis of ulcerative colitis was made elsewhere. Findings from our proctoscopic examination to 10 inches were normal. X-ray films after barium enema showed evidence of ulcerative colitis involving most of the colon, but not the rectum, a small portion of the sigmoid colon, or the terminal ileum. The patient was given intensive medical therapy (without steroids) and obtained complete relief of symptoms. Roentgenograms made in 1955 and 1956 have shown some increased straightening, narrowing and shortening of the sigmoid and ascending portions of the colon and loss of haustral markings, but the terminal ileum has remained uninvolved (Figs. 2a and 2b).

Fig. 2a Fig. 2b

Fig. 2a—Case 2. Filled colon, showing straightening and narrowing of entire colon except the cecum and rectosigmoid portions.

Fig. 2b—Evacuation film showing changes similar to those in Fig. 2a. The rectosigmoid and the ileum appear normal.

This patient has been followed for 144 months. Despite some extension of colitis evidenced by roentgen films, the patient has remained clinically well and asymptomatic since starting medical therapy.

Case 3:—A 60-year old man was examined first in February, 1950. He had had ulcerative colitis for the preceding two years; for the preceding six months he had from 10 to 12 stools with pus and mucus daily and had lost 35 pounds in weight. He was considered to be "toxic". Proctoscopic examination showed

no evidence of chronic ulcerative colitis. Roentgen films made after barium enema indicated an extensive inflammatory process involving the sigmoid and associated with a sinus tract; an irregular, contracted portion of the transverse colon distal to the hepatic flexure seen by fluoroscopy was described at surgery as an area of segmental ulcerative colitis. Because of sepsis during the two weeks following admission, a transverse loop colostomy was done. The surgeon described a huge inflammatory mass associated with perforation and abscess at the site of extensive diverticulitis of the sigmoid colon. The symptoms per-

Fig. 3

Fig. 4

Fig. 3—Case 3. Diverticulitis of sigmoid colon, with probable perforation of a diverticulum (barium enema). The narrowing of the right transverse colon was believed by the surgeon and the roentgenologist to indicate segmental colitis. After a loop colostomy for diverticulitis and an inflammatory mass in the pelvis, the colitis extended to the entire colon.

Fig. 4—Case 4. Right-sided colitis with involvement of the cecum and the ascending colon; there is no evidence of ileitis or disease in the remainder of the colon (barium enema).

sisted after surgery. Barium enema studies indicated extension of the disease, and proctoscopic examination eventually revealed typical ulcerative colitis. Arthritis developed and the patient continued to have blood and pus in the stools and to lose weight. A subtotal colectomy with end-ileostomy was performed in September, 1950. Pathologic findings were chronic ulcerative colitis of the entire colon with fistula formation and slight sarcoid reaction; the terminal ileum was normal. Following colectomy, the patient had no symptoms of colitis, but he died because of heart disease in June, 1953 (Fig. 3).

The patient was followed for 40 months. Before treatment was begun the chief symptoms were probably caused by diverticulitis and abscess. At that time, however, the ulcerative colitis involved only a portion of the transverse colon. Seven months after a transverse loop colostomy was carried out for what was thought to be the primary disease (diverticulitis and abscess), ulcerative colitis extended to the entire colon and rectum, necessitating subtotal colectomy.

Case 4:—A 44-year old woman was examined first in March, 1951. She had been having from 10 to 15 liquid stools daily for the previous two years. Findings on several stool examinations and proctoscopic examinations were normal.

Fig. 5

Fig. 6

Fig. 5—Case 6. Narrowing of the distal transverse colon. Segmental resection was done, but segmental colitis recurred and necessitated total colectomy.

Fig. 6—Case 7. Involvement of the entire colon except the rectosigmoid and ascending portions (barium enema). A previous x-ray film indicated involvement of only 10 inches of colon. Patient was given medical treatment; within 6 months there was improvement as indicated on roentgenograms.

Roentgenographic evidence after barium enema indicated an inflammatory process of the cecum and ascending colon, but a normal terminal ileum. The patient was given an empiric course of antiamebic therapy and medical treatment for chronic ulcerative colitis, including one of the sulfonamides and oxytetracycline. Examinations were made at frequent intervals. The patient herself stopped medical treatment periodically and marked exacerbations developed. Because of her inability to continue medical treatment regularly and because of the recurrence of the symptoms, a right colectomy with end-to-end anastomosis was done in June, 1953. The pathologic finding was subacute inflam-

mation of the cecum with no involvement of the terminal ileum. The postoperative course was uneventful (Fig. 4).

The patient was last examined in January, 1957. She was having eight stools a day, probably because of the previous hemicolectomy. Roentgen films after barium enema showed evidence that the remaining colon, the ileocolic anastomosis, and the ileum were normal.

This patient was followed for 70 months. She had symptoms of ulcerative colitis since 1949, and examination in 1951 showed evidence of right-sided

Fig. 7—Case 8. Ulcerative colitis involving most of the transverse and descending colon. Following colectomy and ileoproctostomy multiple fistulas developed and an end-ileostomy and a resection were required.

colitis. She responded to medical therapy, including two courses of antiamebic therapy; however, she periodically discontinued treatment, and developed repeated recurrences. In 1953 a right colectomy was done; there was no involvement of the terminal ileum. Four years after surgery there was no evidence of recurrence.

Case 5:—A 48-year old woman was examined first in September, 1951, because of the loss of 11 pounds (from 100 to 89 pounds), colicky abdominal

pain, and increasing constipation during the previous four weeks. Results of warm-stool and proctoscopic examinations were negative. Roentgen films after barium enema showed evidence of loss of mucosal pattern, narrowing of the lumen, and shortening of the colon extending from the upper sigmoid to the cecum, but a normal terminal ileum. Medical therapy without steroids was given. Four months later she had regained the weight lost, and bowel function was normal. Six years later (February, 1958) she still was asymptomatic.

This patient has been followed for 77 months. Her presenting symptoms were constipation and cramps rather than diarrhea, but she had ulcerative colitis involving all of the colon except the rectum and sigmoid. She responded to medical treatment and has been asymptomatic for more than six years.

Case 6:—A 21-year old man had been discharged from the army because of ulcerative colitis six months before examination here in June, 1952. During the four months preceding examination he had episodes of vomiting, lower abdominal cramping and diarrhea (from 7 to 10 stools a day). He had lost 23 pounds. Proctosigmoidoscopic findings were normal. X-ray studies showed evidence of a normal small intestine, but after barim enema showed segmental narrowing, irregularity, and abnormal mucosal pattern and polypoid hyperplasia from the mid-transverse to the mid-descending colon. In July, 1952, a segmental resection with a primary end-to-end anastomosis was done. The pathologic diagnosis was ulcerative colitis, segmental in type, of the transverse and descending portions of the colon (Fig. 5).

The patient's condition improved for 7 months; then diarrhea recurred. Roentgen films indicated a narrowed segment of the colon at the site of the previous anastomosis, suggesting recurrence. By August, 1954, the patient's symptoms had progressed. X-ray films showed evidence of shortening of the ascending colon, probably involvement of the terminal ileum, and a narrowed, ulcerated segment about 10 inches long connecting the hepatic flexure to the sigmoid colon. In September an abdominoperineal resection, a total colectomy and an end-ileostomy were done. Following surgery the patient recovered satisfactorily; when last examined (February, 1958), he had gained weight, was working, and felt well.

The patient had been followed for 69 months. Severe, recurrent, universal colitis with involvement of the terminal ileum followed segmental resection for the condition originally diagnosed as segmental colitis. Although the colon that was not resected in the first operation appeared grossly normal to the surgeon, perhaps it also was already involved at that time.

Case 7:—A 22-year old man first was examined here in November, 1956, because of "colitis" of 18 months' duration. Findings on roentgen films made elsewhere in July, 1955, indicated colitis with involvement of 10 inches of bowel. He had diarrhea (seven stools a day, occasionally bloody), and had lost

40 pounds in weight. Proctoscopic findings did not indicate ulcerative colitis. Roentgen films after barium enema showed evidence of shortening and narrowing of the entire colon, but the terminal ileum and rectosigmoid appeared normal. The patient improved steadily with medical treatment (without steroids). Roentgenograms made in March, 1957, showed evidence of some improvement and proctoscopic findings were normal. At the time of his last examination in May, 1957, he continued to be well (Fig. 6).

This patient was followed for six months. Diagnosis was originally made on x-ray evidence. At that time there was involvement of 10 inches of colon. More than one year later, the colitis involved all of the colon except the rectum and a portion of the sigmoid. He responded to medical treatment by relief of symptoms and there were corresponding changes in the appearance of roentgen films.

Case 8:—A 39-year old woman was examined first in December, 1950. She had had recurrent episodes of diarrhea (as many as 30 stools daily) since 1945. Findings on proctoscopic and stool examinations were normal. Roentgen films after barium enema showed evidence of an inflammatory process involving the distal one-third of the transverse and upper portions of the descending colon; the remainder of the colon and the terminal ileum appeared normal. Medical therapy, including two courses of antiamebic drugs, was given despite the fact that findings on stool examinations were normal. The patient became free of symptoms for periods of from two to three months, but had relapses. In October, 1951, friability of the mucosa was demonstrated on proctoscopic examination. The patient requested surgery because of recurring episodes of incapacitating diarrhea, and at that time a subtotal colectomy with an ileosigmoidostomy was done. The pathologic findings were chronic ulcerative colitis and edema at the distal line of resection. The ileum was normal.

One and three years following surgery (January, 1952, and May, 1955) the patient had episodes of obstruction which responded to conservative medical treatment. In July, 1955, she developed an obstruction that necessitated surgery. A small, violin-type band had completely obstructed the ileum at the site of the ileosigmoidostomy. The postoperative course was uneventful. In October, 1955, she developed a rectovaginal fistula, and in March, 1956, multiple perirectal fistulas indicative of recurrent colitis. An end-ileostomy and an abdominoperineal resection were done in March, 1956. She was last examined in August, 1957, and at that time was asymptomatic and apparently in good health (Fig. 7).

The patient was followed for 81 months. The friability of the rectal mucosa just prior to the first operation (ileosigmoidostomy), and the edema of the mucosa at the distal line of resection probably indicated involvement of the rectum and sigmoid colon, although grossly they appeared normal to the surgeon. The rectum and sigmoid were not involved when the patient was first

examined. The development of the fistulas indicated recurrence of active ulcerative colitis.

Case 9:—A 37-year old woman was examined first in March, 1951, because of the sudden onset of bloody diarrhea one month previously. Proctoscopic findings were normal, but roentgenograms after barium enema showed evidence of involvement of the descending and upper sigmoid colon. On medical treatment, the patient improved but had occasional mild diarrhea, gas and bloating. Two years later, roentgenograms after barium enema appeared similar to those made at the time the patient was first examined, and proctoscopic findings were normal.

Except for rare and minor exacerbations, the patient has continued to be well with medical treatment. Proctoscopic findings seven years after the onset of disease were normal; at the same time, roentgenograms after barium enema indicated improvement and there was return of haustral markings in the descending colon, although it still appeared somewhat smooth.

The patient was followed for 86 months. The descending colon alone was involved. Medical therapy resulted in relief of symptoms and improvement in in the appearance of the colon according to roentgen study.

Results of Treatment

The average period of follow-up was five years and nine months. The longest period of follow-up was 12 years, and the shortest was six months.

Medical treatment was given initially to seven of the nine patients. Three (Cases 5, 7, and 9) improved, had relief of symptoms, and had no extension of disease. Barium enema studies of the colons of two patients indicated changes toward a normal appearance. A fourth patient (Case 2), treated only medically, has shown roentgen evidence of slow but definite progression of disease, but has remained asymptomatic and clinically well. Three of the seven patients treated medically (Cases 4, 6, and 8) did not improve or had relapses and required surgery.

Five of the nine patients underwent surgery—three after medical treatment had failed, and two after initial examination at this institution. Segmental resection of the involved colon was done in three patients, with good results in two; one patient (Case 1) has been free of disease and asymptomatic for five years following segmental resection of the descending colon with a primary end-to-end anastomosis; another (Case 4) has been well for four years following a right hemicolectomy for right-sided colitis without involvement of the ileum or rectum; in a third patient (Case 6) subjected to a segmental resection with a primary end-to-end anastomosis the disease has progressed steadily and eventually necessitated a total colectomy with an end-ileostomy and an abdominoperineal resection. This is the only patient of this series who had involvement of the terminal ileum.

One patient (Case 8), after subtotal colectomy and ileosigmoidostomy, required further surgery for obstruction caused by a band of adhesions. Following the second operation, multiple fistulas developed, necessitating total colectomy, abdominoperineal resection, and end-ileostomy. A transverse loop colostomy for diverticulitis of the sigmoid colon was performed on a fifth patient (Case 3). At the time of surgery an area of segmental ulcerative colitis just distal to the hepatic flexure was noted roentgenologically and by the surgeons. The colitis progressed to involve the entire colon and rectum and caused arthritis in addition to colonic symptoms. Following subtotal colectomy with end-ileostomy the patient remained well until 33 months later when he died from acute pulmonary edema associated with arteriosclerotic heart disease.

Comment

The treatment of segmental ulcerative colitis has been reviewed extensively by others[1,3,4,5,7]. The confusion in terminology noted invalidates many reviews, as some of the authors were not discussing true segmental colitis as here defined. In addition, much of the literature was written prior to the advent of recent medical and surgical therapeutic measures. The case reports in the preceding section illustrate that the course of this disease may vary from a prompt response to conventional medical treatment to a fulminating process eventually necessitating total colectomy.

Our series and those of others indicate that no one mode of treatment is effective for all patients. We believe that segmental ulcerative colitis should be treated in much the same way that the more common chronic ulcerative colitis is treated. Intensive and continuous medical management should be given adequate trial[8,10]. Steroidal therapy may be helpful, but there is disagreement concerning the value of steroids in ulcerative colitis. Other measures, including rest, high-protein, high-caloric diets, supplemental vitamins, nonabsorbable sulfonamides, antibiotics, and "common-sense" psychotherapy have been outlined previously[8,10]. The rarity of this type of colitis makes it difficult to collect data on a large number of patients, but we believe that medical treatment should be given an adequate trial before considering surgical intervention.

Because of the bizarre involvement of the colon, all patients with segmental colitis should have several warm-stool examinations. A thorough course of antiamebic therapy is indicated even when the findings are negative. If adequate medical management fails to effect a remission, surgical intervention is indicated. Banks, Korelitz and Zetzel[7], referring to the segmental form of the disease, stated, "1. that there is rarely justification for an internal shunt without resection in the surgical treatment of segmental colitis, and 2. that, if surgery is indicated at all, subtotal colectomy rather than local resection is the procedure of choice." Our surgical experience with segmental ulcerative colitis does not completely agree with the latter part of that statement, as two of our three patients improved

after segmental resection. We believe that the basic principles of surgical treatment are the same for the segmental type as for the common universal type of chronic ulcerative colitis—namely, total excision of the diseased colon. Segmental excision with end-to-end anastomosis should be done first; we believe that it is advisable to leave some of the colon, despite the fact that the disease may recur.

With a segmental resection, normal function and use of the bowel and rectum are preserved. At surgery it should be ascertained by the use of frozen sections that the tissues at the lines of resection are free of disease[10], as an anastomosis of diseased bowel is prone to poor healing, the development of "leak", recurrence of the disease, and other complications. The failure of ileosigmoidostomy in one patient may have been due to unrecognized involvement of the rectum and sigmoid at the time of operation (the rectal mucosa was friable, and pathologically the mucosa at the distal line of resection showed edema).

It is physiologically wasteful to remove normal bowel, with subsequent loss of bowel function as in subtotal colectomy with ileostomy, when removal of only the diseased bowel, as in segmental resection, might suffice. The two patients in our series who have improved after segmental resections would not have been so happy with subtotal colectomy and ileostomy and the loss of normal bowel function.

We feel that in selected cases the operation of choice is segmental resection with removal of all diseased bowel. Later, if there is recurrence or extension of the disease, more extensive surgery such as subtotal colectomy with ileostomy may be done. We believe that the first operation should be the simplest procedure that might result in cure and still maintain, if possible, normal bowel function. If progress is not satisfactory after segmental resection, and severe, incapacitating recurrences develop, a more extensive operation (total colectomy) may yet be done. If the rectum is not involved, and even if there is widespread involvement of the colon, a subtotal colectomy with ileoproctostomy, avoiding ileostomy and preserving rectal function, can and should be done.

Summary

Segmental ulcerative colitis has been defined to include only that type of colitis that is limited to a segment or a portion of the colon with no involvement of the terminal ileum or the rectum. In published reports many cases of so-called segmental ulcerative colitis have been included in which the ileum was involved (ileocolitis or right-sided ulcerative colitis with retrograde involvement of the terminal ileum); this has brought about confusion as to the definition of the entity.

Nine patients with segmental ulcerative colitis have been observed at the Cleveland Clinic and are discussed. Our incidence of patients with segmental

colitis, as compared to the incidence of patients with all types of ulcerative colitis, is approximately one per cent.

Of seven patients treated medically four made satisfactory progress, while in three the disease progressed and required surgery.

Of the nine patients five underwent surgery and in all good results were achieved, although some patients required more than one operation. Two of three patients in whom segmental resections of the involved areas were done had no recurrence of colitis in four and five years.

We believe that medical treatment should be given initially. If the disease fails to respond to adequate medical therapy and/or there is progression of the disease, surgical treatment is indicated.

Surgical treatment should remove completely the diseased tissue, but at the first operation preservation of normal bowel (i.e. segmental resection) is advisable. If there is incapacitating recurrence, subtotal colectomy with ileoproctostomy or total colectomy with end-ileostomy may be done subsequently.

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COMPARATIVE ACCURACY OF STANDARD AND TUBELESS GASTRIC ANALYSIS IN THE DIAGNOSIS OF DUODENAL ULCER

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Most duodenal ulcers can be readily diagnosed on the basis of a careful history and adequate roentgenographic study. In patients with atypical histories and equivocal x-ray findings, analysis of the gastric contents may supply welcome diagnostic aid.

Although measurement of gastric acidity by titration of aspirated stomach contents has been in clinical use for over 60 years, adequate standards for the test were established just 25 years ago by Vanzant. In her analysis of almost 6,000 Ewald tests, utilizing the acidity value obtained one hour after a carbohydrate meal, she found that even though hypersecretion was the rule in patients with duodenal ulcer, the range of normal was so great that no reading could be pathognomonic of any disease[1,2].

Progressive refinements in technic have steadily raised the accuracy of intubation tests in the diagnosis of duodenal ulcer. Musick[3] et al, titrated ten-minute fractional samples of gastric juice aspirated for 60 minutes after a 500 mg. oral dose of caffeine and found that 94 per cent of 34 ulcer patients secreted more than 300 mg. of hydrochloric acid whereas only 8 per cent of 74 controls did so, for a total error of only 14 per cent.

Employing similar technic but using 50 mEq. of hydrochloric acid per liter of gastric juice as the dividing value, Roth[4] found 14 per cent false positive results in 62 control patients, and 7 per cent false negative results in 82 duodenal ulcer patients.

Littman[5] employed a single aspiration 90 minutes after caffeine and found that 82 per cent of normals secreted less than 25 mEq. per liter of free acid, whereas only 2 per cent of duodenal ulcer patients had secretory responses below this level, for a combined error of 20 per cent.

Also using a caffeine test meal, Raimondi[6] found that 78 per cent of ulcer patients responded with prolonged gastric secretion. He pointed out that the caffeine and the carbohydrate test meals give essentially the same information: gastric stimulation in an ulcer patient is followed by hypersecretion for abnormally long periods.

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Levin, Kirsner and Palmer[7] demonstrated that hypersecretion occurs at diagnostically higher rates in duodenal ulcer patients even without stimulation. Measuring one-hour basal secretions, they found that only 1 of 222 patients with duodenal ulcer failed to secrete free acid in all four 15-minute periods, whereas 50 per cent of normals and 75 per cent of gastric ulcer patients had at least one period of anacidity.

TABLE I

MODIFICATIONS OF TUBELESS GASTRIC ANALYSIS
DISCRIMINATORY ACCURACY IN DUODENAL ULCER

Test Modification	Number of Patients		Specimen	Upper limit (Excretion Quinine in Urine)	% of Patients with Hyperacidity	
	DU	N			DU	N
I Control period 1 hr. Collection at 2 and 4 hrs.	32	100	2nd hr.	200 mcg.	65	32
			4th hr.	200 mcg.	74	36
			4 hr. total	400 mcg.	70	36
II Control period 90 min. Collection at 90 min.	8	55	90 min.	150 mcg.	63	45
III Control period 90 min. Collections at 2 and 4 hrs.	41	100	2nd hr.	200 mcg.	55	46
			4th hr.	200 mcg.	70	58
			4 hr. total	400 mcg.	80	48
IV Control period 2 hrs. Collection at 1 hr.	6	21	1 hr.	150 mcg.	63	45

While intubation gastric analysis can provide diagnostically useful information it is heartily disliked by most patients and flatly rejected by some. The tubeless gastric analysis, devised by Segal[8] in 1950, obviated these objections.

Multiple studies have established that tubeless gastric analysis is for practical purposes as accurate as intubation analysis in supplying an answer to the question of whether or not the patient can secrete hydrochloric acid[9-14]. In a small percentage of patients acid secretion can be detected by intubation following histamine when the caffeine tubeless analysis indicates achlorhydria[15]. Recent modification of the tubeless test material with substitution of the blue dye, Azure A, for the fluorescent quinine indicator has eliminated the need for

a fluorophotometer without sacrificing the accuracy of the test in detecting achlorhydria[16,17].

Most observers have agreed that no quantitative relationship can be shown between the amount of indicator-ion (quinine or Azure A) excreted in the urine and the acidity of the aspirated gastric juice measured as clinical units or as pH. Donovan and Tighe[18], however, reported a straight line relationship between urinary quinine excretion in the tubeless test and the mean values for aspirated acid expressed in a single figure representing both volume and concentration of acid. They implied that the tubeless method could yield quantitative data even in hypersecretory states. This possibility was explored by Galambos and Kirsner[19] utilizing the Azure A test, and they were unable to find any correlation between the amount of hydrochloric acid secreted after betazole (Histalog) and the amount of indicator-ion which appeared in the urine.

TABLE II

STANDARD EWALD TEST
DISCRIMINATORY ACCURACY IN DUODENAL ULCER

Group	% of Patients with Hyperacidity (Over 40° Free HCl)	
	DU	N
Males age 20-49	24	21
Males age 50-80	40	21
Females age 20-80	26	8

To explore the possibility of devising a tubeless gastric analysis productive of quantitative data which would be useful in differentiating duodenal ulcer patients from normals, we studied several modifications of the original technic described by Segal. Quantitative determinations of indicator-ion excretion were performed on urine specimens collected at varying intervals after a caffeine meal. The study was begun prior to the time Azure A resin became available and the quininium resin was employed throughout for the sake of consistency.

Our results are set forth in Table I. It can be seen that maximal discrimination between duodenal ulcer patients and normals was obtained with the test (Modification I) in which a one-hour control period was followed by urine collections at two and four hours (time elapsed after ingestion of the resin). In the first urine specimen, collected two hours after resin ingestion, approximately twice as many duodenal ulcer patients, as compared to normals, exceeded the cutoff value of 200 micrograms quinine excretion. This held true

for the second hour, fourth hour, and four-hour total values, which would indicate that little was gained by extending the collection period.

It has been repeatedly demonstrated[3,4,5] that most duodenal ulcer patients secrete hydrochloric acid at a high level for two hours or longer ("plateau phenomenon"). This contrasts sharply with normals who may reach high levels briefly, but subside quickly to baseline level. We modified the tubeless test to comprise a longer control period in which, presumably, acid secretions following the caffeine stimulus would subside in normals. Administration of the resin at a later point in time might be expected to detect the high plateau secretion characteristic of duodenal ulcer patients. In Test II the control period was 90 minutes, with a 90-minute urine collection. A discriminatory advantage of only 18 per cent was achieved.

In Test III, urine collections were made two and four hours after a 90-minute control period. A 32 per cent discriminatory advantage was obtained with the values for the four-hour total quinine excretion, 80 per cent of ulcer patients showing hyperacidity as compared to 48 per cent of normals.

Extending the control period to two hours, in Test IV, gave a discriminatory edge of only 18 per cent in favor of duodenal ulcer patients.

Because of the small number of ulcer patients studied with Test modifications II and IV, statistically significant conclusions cannot be made.

Comparison between the two statistically significant studies, Tests I and III, shows that neither achieved a discrimination of over 35 per cent, and that even this is achieved with the simpler test (I) employing a one-hour control period and a two-hour urine collection.

A comparative analysis was next made of the diagnostic value of a standard intubation test (Ewald) in duodenal ulcer patients. The test employed was identical with the one used by Vanzant[1]. The highest obtained free acid value was recorded for 100 ulcer patients and 100 controls in each of three groups: females, males under 40 years of age, and males over 40 years of age. The male patients were divided into two age groups because of the decline of average acidity values with advancing age in males[1]. Results of this analysis are set forth in Table II.

It can be seen that the discriminatory capacity of the standard Ewald test in patients with duodenal ulcer is approximately of the same order as the best modification of the tubeless gastric analysis (Test I), i.e., hyperacidity occurred twice as frequently in ulcer patients as in normals. With 40 degrees of free acid as the upper limit of normal (in this clinic), hyperacidity was found in 90 of 300 ulcer patients, and in 50 of 300 normals. Others[20] consider 45 degrees of free acid as the upper limit of normal, and to test the validity of our results, the Ewald data were reanalyzed, using 50 degrees as the cutoff value. The same

relative incidence (2 to 1) of hyperacidity was found, with 53 ulcer patients and 26 normals exceeding the cutoff value.

An interesting aspect of the Ewald test results was the difference in the discriminatory value in ulcer patients relative to the age and sex of the patients. The incidence of hyperacidity was the same in duodenal ulcer and in normals for the young males (under age 50). In males over 50 years of age hyperacidity was twice as frequent in those with ulcer, and in females hyperacidity was more than three times as frequent in ulcer patients. Comparable significant analysis of the tubeless test results was precluded by the smaller number of patients studied.

Comment

It would appear that the standard Ewald test and the various modifications of the tubeless gastric analysis fail to provide reliably quantitative information regarding the characteristic hypersecretion of hydrochloric acid in duodenal ulcer patients. This failure is probably due to variation in gastric emptying time, a critical factor which is neither controlled nor measured in these tests.

Summary

Several modifications of the tubeless gastric analysis were evaluated in duodenal ulcer patients and in normal controls. The results were compared to those obtained with a standard intubation test (Ewald). Neither the Ewald nor the tubeless tests appeared sufficiently accurate to be clinically helpful in distinguishing ulcer patients from normals. It seems probable that gastric analysis can provide diagnostically useful information in patients with duodenal ulcer only if one of the more precise intubation technics[3,4,5,7] is employed.

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TREATMENT OF NONSPECIFIC, AFEBRILE DIARRHEAS WITH DONNAGEL

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One of the frequent problems encountered in the management of diarrhea is the failure of many medications to relieve the discomfort brought about by abdominal cramps that often accompany the more severe cases. While otherwise effective, the usual preparation containing kaolin and pectin, for example, has little or no effect on cramps simply because it does not include an agent with antispasmodic action.

Recently, the writer was afforded an opportunity to test—over a nine-month period—a combination of kaolin and pectin with belladonna alkaloids[1], available under the trade name of Donnagel®†. It proved to be unusually effective both in controlling diarrhea and in relieving cramps in a total of 104 cases (62 males and 42 females) of nonspecific diarrhea in patients ranging in age from 5 to 76 years.

Forty-four of these cases, ranging from 5 to 66 years, were treated in the observer's private practice, either at home or in the office. An additional 33 cases ranging from 31 to 76 years were seen in the Medical Clinic of St. Barnabas Hospital in Newark, N. J. The remaining 27 cases were students attending the Newark (New Jersey) Colleges of Rutgers University and were from 17 to 29 years of age. They were seen in the University's Student Health Department.

All 104 cases were treated as out-patients and were given prescriptions for the above medication to be taken as directed at home. Duration of symptoms ranged from eight hours to approximately two weeks and were of varying severity.

The Donnagel‡ dosage recommended by the manufacturer was prescribed in the majority of cases, namely: one to two tablespoons (15 to 30 c.c.) every four hours for adults and one to two teaspoons every four hours for children over 1 year. In excessive diarrheas, however, this dosage was prescribed after each bowel movement. In general, medication proved to be more effective if

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†Manufactured by A. H. Robins Co., Richmond, Va.

‡Donnagel contains the following components per 30 c.c. (fluid ounce): kaolin, 6.0 gm.; pectin, 142.8 mg.; dihydroxy aluminum amino acetate, 0.25 gm.; hyoscyamine sulfate, 0.1037 mg.; atropine sulfate, 0.0194 mg.; hyoscine hydrobromide, 0.0065 mg.; phenobarbital, 16.2 mg.

taken on a fairly empty stomach, before rather than after meals. Except as noted elsewhere in this report, Donnagel was the only medication administered.

Etiology

As many of my colleagues will confirm, it is often impossible to establish the etiology of diarrhea. Patients are sometimes unwilling to admit overindulgence in food or alcohol or are unaware of a recent psychic disturbance. Yet any of these factors may bring about a severe attack of diarrhea. In many instances, however, the writer was able to determine causes and these are reported below.

Sixteen cases were complicated by upper respiratory infections of varying severity which pointed strongly to a virus etiology. Twenty-two of the cases treated at the University were seen during the period of final examination and their diarrhea was felt to be completely psychogenic in origin.

Many of the patients seen at the St. Barnabas Medical Clinic were of advanced age and diarrhea was frequently caused by nutritional inadequacies. These patients were usually given supplemental vitamins either parenterally or by mouth and placed on a moderately restricted, low-residue diet.

Response to Treatment

Ninety of the 104 cases were ambulatory throughout the course of the diarrhea and continued with their normal routine, while 14 were ill enough to require bed rest at home. No cases were hospitalized, although it was considered in one instance.

It might be said that the student group produced the best results when medicated with Donnagel as all responded very rapidly after therapy was instituted. In fact, symptoms disappeared quite dramatically after the ingestion of from one to five doses of one tablespoon at four-hour intervals.

In 28 cases complicated with severe abdominal cramps, results were again dramatic, as 26 reported almost complete relief after 2 to 6 doses of medication. In certain instances, patients reported cessation of cramps before the diarrhea had ended.

Two five-year old children, with diarrhea of varying severity[2], were treated at home. One child had been ill for approximately four and the other for ten days. The latter case, when first seen, was quite dehydrated and hospitalization was considered. Within 12 hours after institution of therapy, however, the child was able to retain fluids without difficulty. The frequency of bowel movement in this period dropped from 8 to 3 with only a single movement in the succeeding 12-hour period. The medication proved so effective that hospitalization was unnecessary.

Duration of Treatment

Treatment required for cessation of diarrhea varied from approximately 8 hours to 7 days. The latter period was required by a patient 67 years of age with many psychogenic factors as well as a severe avitaminosis. He finally responded and began to have normal stools after approximately 7 days of treatment.

Six cases treated at the St. Barnabas Medical Clinic were seen in consultation by the Proctology Department within 24 hours of their first visit. They were sigmoidoscoped for an average distance of 25 cm. and several of the reports indicated marked hyperemia of the bowel mucosa with small areas of ulceration in 2 cases. These 2 cases were proctoscoped again upon subsidence of symptoms. The hyperemia originally noted was considerably abated and the areas of ulceration were not seen. These were not considered as cases of ulcerative colitis but rather secondary hyperemia resulting from the diarrhea.

Eleven cases seen in private practice had been taking a preparation containing only kaolin and pectin for as long as 4 days before presenting themselves for treatment with only moderate improvement in symptomatology. They were advised to stop their original medication and were changed to Donnagel in the usual dosage. Within 24 hours, relief was dramatic in 9 of the 11. The other 2 cases in this group required a period of 4 days of medication before control of the diarrhea was achieved.

In only 8 patients was any supplemental medication necessary to effectuate a complete return to normal bowel habits. Five of these were over 60 years of age and camphorated tincture of opium was administered in teaspoonful dosages to supplement the Donnagel, after 5 days of medication had failed to effect a complete cure. While there had been improvement, paregoric produced a complete remission in diarrhea. In 2 instances it also brought about a constipation which required further therapy. Rebound constipation was not noted in any of the cases treated solely with Donnagel. Once the diarrhea had ceased, a return to normal bowel habits was usually the case.

Conclusions

There appeared to be little variation in the rapidity and completeness of response when an attempt was made to analyze these results on the basis of various etiologies, wherever such etiology was known. Causes of the diarrheas treated varied from minor to severe psychogenic disturbances, minor to severe dietary indiscretions, moderate to excessive alcohol consumption and complications of minor respiratory infections. All responded rapidly to administration of Donnagel.

The rate of recovery apparently was more closely correlated with the age of the individual than with the underlying cause of his symptoms. Many of

these cases had completely idiopathic diarrhea. These were generally considered to be of psychogenic origin whenever a careful dietary history for the preceding 2 days failed to elicit any unusual food or increased amount of a frequently used food. The psychic disturbances were frequently unknown to patients, or deliberately hidden.

The criteria used for determining the effectiveness of treatment were twofold and consisted in evaluation of the total number of bowel movements as well as the observation by the patient of the character and consistency of the stool. A diminution in the total number of bowel movements to approximately one-half that noted prior to institution of treatment was considered an improvement but not a cure. The return to bowel habits experienced by the patient prior to the onset of the illness was considered to be a cure. It was necessary to assess both factors before advising a patient to discontinue medication.

Summary

1. One hundred and four otherwise normally healthy individuals were treated for acute diarrhea of varying etiology with a preparation of belladonna derivatives and phenobarbital combined with kaolin and pectin (Donnagel).

2. Cases ranged in age from 5 to 76 years. None was hospitalized but in 14 instances bed rest at home was necessary. The others did not depart from their normal daily routine.

3. The antispasmodic-sedative present in Donnagel apparently produced results not possible with kaolin and pectin alone. Admittedly, the occasional self-limiting nature of a bout of diarrhea could perhaps explain some of these results, but certainly not all of them.

4. The relief of troublesome abdominal cramps and distress was dramatic and in itself was a further indication for the use of this medication.

5. In only 8 of the 104 cases reported was it necessary to supplement medication in order to accomplish the desired results.

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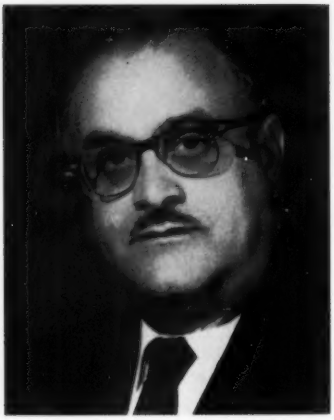

President's Message

Duties of the Governors

The Board of Governors, according to the Constitution, shall act as a liaison between the Board of Trustees and the Fellows. One of its duties is to act as a clearing house for the Board of Trustees on general subjects and on local problems. A Member of the Board, who is unable to attend an Annual Session, has the privilege of appointing an alternate Governor to act on his behalf at the Session. Members of the Board of Governors are expected to attend Convocations and other formal meetings of the Fellows and Governors and should aid in establishment of groups and encourage regional meetings. They shall coordinate and further the best interests of the College in their respective states and perform such duties as may be assigned by the Board of Trustees.

At a recent Board meeting it was suggested that the Board of Governors send in the name of a hospital, which does not now receive the Journal. A gift subscription will then be entered for one year.

Although most Governors are doing a magnificent job in their localities it appears that some are delinquent in their duties, and, recommendations to appoint new Governors in some communities have already been made. I would like to take this opportunity to ask each Governor to take a more active part in performing his duties for the College.

As President of the American College of Gastroenterology, and, also on behalf of the Chairman of the Board of Governors, I am making an appeal that a study be made by each Governor of the Members and Associate Fellows in his community with recommendations for advancement if they are qualified.

Second, that any physician in their particular locality interested in gastroenterology be personally contacted and recommended for Membership, Associate Fellowship or Fellowship according to their eligibility.

Third, that the name of the hospital in the area to receive the Journal be mailed to the Editor as soon as possible.

Fourth, a concerted effort be made to attend the next Convocation, Board and Fellowship meetings and other activities of the coming Convention, in addition to stimulating other Members, Associate Fellows and Fellows to more active participation in the affairs of the College.

An organization can only improve if its purpose and objectives are encouraged.

Frank J. Borrelli

ABSTRACTS FOR GASTROENTEROLOGISTS

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ALEXANDER ZABIN

GASTROINTESTINAL TRACT

ABDOMINAL ENLARGEMENTS OF INFANCY AND CHILDHOOD: Joseph R. Christian. Med. Times 86:430 (Apr.), 1958.

Among the more frequent causes of abdominal enlargements are those arising from the kidneys, sympathetic nervous system, gastrointestinal tract, adrenal glands and ovaries. Fecal impaction, ranking as the most common cause may produce partial or complete obstruction. Hirschsprung's Disease produces a more generalized enlargement with or without fecal impaction.

In the neonatal period meconium ileus, atresia of the small bowel and hypertrophic pyloric stenosis may be the etiologic factors related to abdominal enlargement. Perforation of a stress ulcer of the stomach or duodenum, secondary to severe infectious processes, central nervous system disorders or burns, is occasionally encountered. This is usually seen in infancy and produces severe abdominal pain, distention, vomiting, diarrhea or constipation.

Neuroblastoma, with the most common site or origin in the adrenal medulla, ranks second to leukemia in frequency of neoplastic growths. Wilm's Tumor arises only from within the kidney and often cannot be differentiated from the former except at operation. Both tend to metastasize.

The prognosis in all cases depends on early diagnosis. Flat plate of the abdomen can give as much or more information than barium studies without the dangers of aspiration or inspissation of barium, or the perforation of an obstructed bowel.

SAUL A. SCHWARTZ

STOMACH

THE PHYSICIAN'S ROLE IN EARLY DIAGNOSIS OF GASTRIC CARCINOMA: Hu C. Myers. Clin. Med. 5:509 (Apr.), 1958.

With nine out of ten people with gastric carcinoma still dying with the disease, the author has concerned himself with possible causes for this and what might be done to remedy the situation.

Inasmuch as screening tests are imprac-

tical so far as the general population is concerned, he did feel that Wangensteen's observations that persons with low gastric acidity have such a high incidence of carcinoma that they should be examined by complete x-ray series every six months. Furthermore, he felt that any patient complaining of anorexia, indigestion, gas, and a feeling of fullness in the epigastrium, who was past 40 years old, and especially if it is a man, should be examined by the x-ray if the symptoms did not disappear within one week. He emphasizes that delay in operation was found in 77 per cent of the patients seen during this 20-year period and feels that the patient should be urged to have the operation without deliberation when there is any question of a cancer of the stomach being present. It was found that 35 per cent survived after gastrectomy for more than five years, while in those in whom the lesion was confined to the stomach, 66 per cent survived five years.

It is his conclusion that over one-half the patients with cancer of the stomach should be saved by effective use of present day diagnostic treatment methods provided there is no delay in the diagnosis and that the patient is induced to have a gastrectomy early.

L. K. BEASLEY

BLEEDING FROM THE UPPER PART OF THE GASTROINTESTINAL TRACT SECONDARY TO INGESTION OF ACETYLSALICYLIC ACID (ASPIRIN): Timothy A. Lamphier and W. Arthur Young. J. Internat. Coll. Surgeons 29:395 (Apr.), 1958.

A series of 12 cases of aspirin sensitivity was present, in which 6 of these cases the condition was apparently the result of prolonged aspirin therapy. In the other 6 there were true examples of hypersensitivity. Emphasis was placed on the close relation of sweet clover disease in animals to gastric bleeding in man, secondary to aspirin sensitivity. It was pointed out that, in the differential diagnosis of bleeding from the upper part of the gastrointestinal tract, hypersensitivity to aspirin should be considered. Emergency subtotal gastrectomy can and should be avoided when aspirin is known to be the causative factor.

It was observed that there are two types of reaction in patients with sensitivity to aspirin: 1. alterations in the prothrombin level and 2. depletion of ascorbic acid stores, with subsequent increased capillary fragility and lack of adhesiveness of platelets.

ALVIN D. YASUNA

THE BENIGN PEPTIC ULCER: M. W. White. J. Michigan M. Soc. 57:573 (Apr.), 1958.

The author attempts to disprove the theory of gastric hyperacidity as the pathogenic factor in the production or the continuity of the benign gastric or duodenal ulcer.

In a pathological study of resected stomachs, he found instances of, despite an intact muscularis and serosal layer, inflammatory reactions extended into omental fat where a gastric ulcer prevailed and into the pancreas where a duodenal ulcer existed. He also found in numerous stomachs complete absence or great diminution of parietal and chief cells, in the presence of extensive gastritis or ulceration and necrosis.

He advances the following factors to consider in the initiation and perpetuation of the benign ulcer. 1. Chronic bacterial infection. 2. Allergic or parasitic. 3. Fibrinoplastic ischemia *(endarteritis obliterans)*. 4. Edema (Na or Cl retention). 5. Faulty healing (hypoprotenemia, Vitamin C deficiency).

SAUL A. SCHWARTZ

INTESTINES

KWASHIORKOR IN THE ADULT DUE TO AN INTESTINAL BLIND LOOP: Dennis M. Krikler and Velva Schrire. Lancet 1:510 (8 March), 1958.

Uncontrollable diarrhea following abdominal operation is suspicious of short-circuiting of the small bowel. This abnormality causes a severe malabsorption with deficiency of fat, protein, vitamins and minerals. A 42-year old male developed severe

diarrhea and steatorrhea following a small bowel exclusion operation for an intestinal obstruction. He developed subsequently various deficiency symptoms resembling "Kwashiorkor" of infants. There were pellagrous skin changes, a bald red tongue, angular cheilosis, stomatitis, meteorism, testicular atrophy, and reduction of libido. Ankle reflexes were absent, pain perception of the leg decreased, night vision was poor. Photophobia and temporal pallor of the optic disk were also observed. Laboratory findings included macrocytic anemia, reversal of albumin/globulin ratio, fatty stool and nonspecific ECG changes. The most obvious alteration was a change of his brown hair to a scanty growth of red hair. This abnormality is responsible for the name "Kwashiorkor" which means red boy. Removal of the short-circuit by surgery led to a dramatic recovery. The various symptoms disappeared and an abundant growth of his normal brown hair reappeared.

H. B. EISENSTADT

THE CLINICAL PROBLEM OF THE CONSTIPATED WOMAN: Joseph B. Raddin. Med. Times 86:302 (Mar.), 1958.

Treatment of constipation depends on accurate diagnosis.

Anorectal pathology is a common cause. Internal hemorrhoids, external hemorrhoids and anal fissures all cause hindrance to the easy expulsion of a normally formed stool. Converting to a soft or watery stool by laxative permits easier passage of the stool but fails to correct the underlying disorder. Internal hemorrhoids can be cured by injection of sclerosing solutions. External hemorrhoids can be cured by simple excision of the vein and removal of the clot. Biliary tract disorders are another common cause of constipation. They produce a gassy type of constipation, abdominal distention and cramps because an inadequate amount of pancreatic and bile juices are emptied into the intestinal tract to prepare food for digestion. Treatment consists of intravenous Decholin, bile salts and bile acid medication by mouth, and colecystectomy if gallstones are present.

Less common causes of constipation are hypothyroidism, amebic colitis, food allergy, lack of balanced diet, and neglect of physical exercise.

The dangers of laxatives are stressed. Cathartics, purgatives and salts produce their action by irritating the lining of the colon. "Bulk" laxatives accomplish little that a balanced diet will not do. They have the danger of sometimes causing bowel obstruction or fecal impact in older individuals. The "wetting agents" recently introduced accomplish nothing. Mineral oil is not recommended because it coats food with an insoluble film of oil which prevents absorption of vitamins and hinders digestion. Enemas, properly administered, if not employed regularly, are the method of choice for prompt but temporary relief of constipation.

Constipation is a symptom requiring careful diagnostic work-up, and should not be treated with laxatives.

WALTER LENTINO

THE DIAGNOSIS AND MANAGEMENT OF RECTAL BLEEDING: Robert W. Bartlett: Mississippi Valley M. J. 80:105 (Mar.), 1958.

The author describes the contrasting picture presented by a carcinoma in the right and left side of the colon.

The importance of proctoscopy and barium enema in all patients undergoing hemorrhoidectomy is pointed out.

Since large bowel polyps are considered premalignant, they should all be removed. Familial polyposis should be treated radically with a total colostomy followed by a proctostomy or permanent ileostomy.

Tuberculous of the cecum is a rare cause of rectal bleeding. Diverticulitis is not an infrequent cause of rectal bleeding. It may or may not be associated with obstruction of various degrees.

Lymphogranuloma venereum especially in negros. produces a long constricting bleeding of lesion of the rectum.

Endometriosis of the colon may cause rectal bleeding especially at the time of the menses.

Chronic ulcerative colitis, though frequently best treated medically, will require

surgery when it is not possible to control the symptoms medically or when complications of bleeding, perforation, abscess or obstruction and multiple polyposis with malignant degeneration occur.

ALEXANDER ZABIN

GENERALIZED SCLERODERMA ASSOCIATED WITH CHRONIC ULCERATIVE COLITIS: Richard O. Bicks, Moshe B. Goldgraber and Joseph B. Kirsner. Am. J. Med. 24:447 (March), 1958.

Chronic ulcerative colitis has been related to the collagen diseases. Therefore, the case of a 24-year old female, who developed generalized scleroderma five years after the beginning of classical ulcerative colitis is of interest. In addition, symptoms of rheumatic fever, rheumatoid arthritis, dermatomyositis, and systemic lupus were suggested during the prolonged course of the disease. The latter might have been partly produced by the large doses of ACTH and cortisone that were administered. This medication was also responsible for Cushing's syndrome, adrenocortical atrophy, bleeding peptic ulcer, and osteoporotic fractures of humerus and vertebrae. The microscopic changes of scleroderma such as patchy deposition of collagen in the submucosa, arteriolar fibrosis, fibrous thickening of the external muscularis and serosa were noticed in the colon in addition to the usual alterations produced by ulcerative colitis.

H. B. EISENSTADT

RENODUODENAL FISTULA: Richard L. Smythe and Roger D. Williams. Am. J. Surg. 95:462 (March), 1958.

Fistulas between the kidney and duodenum have been reported several times. Most of these are secondary to surgery. Spontaneous renoduodenal fistula is rare and is nearly always secondary to renal disease. The writers report a case of renoduodenal fistula in a 39-year old white male, of three years' standing, and debilitating, which responded favorably to nephrectomy, excision and closure of the fistulas, after two previous surgical approaches had failed.

CARL J. DEPRIZIO

REGIONAL ILEITIS. Ulysses Grant Daily. J. Internat. Coll. Surgeons 29:308 (March), 1958.

The author reports five cases of regional ileitis and discusses the history of this condition. The differential diagnosis is carefully discussed; acute appendicitis, ulcerative colitis, tuberculosis and carcinoma of the cecum must be ruled out.

The disease occurs in all ages and all sexes. Unlike ulcerative colitis it does not cause menstrual disturbance.

The relationship of this disease to chronic nonspecific ulcerative colitis is unexplained.

It is thought the treatment should be palliative and supportive until a definite diagnosis is arrived at. Frequent recurrence of ileitis following surgery is leading to a reevaluation of criteria for operation.

ABRAHAM BERNSTEIN

THE TREATMENT OF ACUTE AND CHRONIC ULCERATIVE COLITIS: Charles H. Brown. Am. Pract. & Digest. Treat. 9:405 (March), 1958.

The two basic fundamentals of treatment are rest and food. Rest should include complete mental, emotional and physical relaxation. The best psychiatric treatment is considerate, understanding and gentle care by the patient's own doctor. Mild sedation and some of the tranquilizing drugs may be of help in producing mental rest. It is imperative that those patients receive a high protein, high carbohydrate, high caloric, low residue diet. If the patient is unable to eat, parenteral fluids must be given. Dextrose and amino acids and plasma may be required. The most supportive measure is the transfusion of whole blood. Since these patients are usually anemic, it is important to keep the hemoglobin above 12.0 gm. Supplemental vitamins ad-

ministered in rather large doses are necessary and should inclue A, D, C and the entire Vitamin B-complex. Vitamin K is indicated if hypoprothrombinemia is present.

Sulfathalidine or sulfasuxidine, two one-half gm. tablets four times daily, may be given for long periods of time. Azulfidine in the same dose is indicated, particularly when there are systemic complications such as rheumatoid arthritis. If the ulcerative colitis is limited to the rectum and sigmoid, retention enemas of sulfathalidine, 1 gm., and penicillin, 100,000 units, in 3 to 6 ounces of water, are used at bedtime. Results are not sufficiently favorable to warrant the routine use of steroids in the treatment of ulcerative colitis.

Indications for surgical treatment are the usual well defined ones.

ALVIN D. YASUNA

VOLVULUS OF CECUM COMPLICATING NONROTATION OF MIDGUT: M. F. Butler. Brit. M. J. 5072:689 (22 March), 1958.

The author describes a case of acquired volvulus of the whole midgut loop in a case of nonrotation occurring in an adult female 37 years of age. The case described is of interest because it simulates the rare anomaly of reversed rotation usually found in the neonatal period.

Normally the midgut returns to the abdomen during the 10th week of fetal life in the same relative position it occupied in the cord. The small intestine is found to the right of the midline and the large bowel to the left and the ileum enters the cecum from the right. During the normal progression of the 2nd stage of rotation the mesentery of the midgut and the large bowel develop adhesions to the posterior wall bringing about the anatomy normally found. If this fails to occur completely or partially there is apt to result a volvulus of the cecum alone or of the complete midgut in a clockwise direction. The same anatomical conditions are found in congenital reversed rotation of the midgut, when during the 10th week of fetal life, in its return to the abdominal cavity and 180° clockwise rotation occurs. In the case described there was complete lack of any secondary fixation of the midgut mesentery or of the bowel itself from the level of the second part of the duodenum to hepatic flexure. Rotation had occurred in a clockwise direction and obstruction was produced at the hepatic flexure by axial rotation of the bowel and perhaps by overlying compression by the mesenteric vessels. The duodenum, of course, was not involved in the torsion. Reduction was easily accomplished by counter-clockwise rotation. No attempt was made to fix the bowel, it being left in the position of nonrotation.

ALEXANDER ZABIN

THE PROBLEM OF ILEOCOLITIS: Richard H. Marshak and Joan Eliasoph. Am. J. Digest. Dis. 3:181-203 (March), 1958.

The term "ileocolitis" in the opinion of the authors is inadequate as it refers only to the anatomic localization of the process with no differentiation as to its character or origin. In order to lead us out of a maze of nomenclature the following classification is suggested:

1. Right-sided ulcerative colitis with 'backwash ileitis',
2. Segmental (granulomatous) colitis with ileum involvement,
3. Regional enteritis with colon involvement,
4. Combined ileocolitis, segmental-granulomatous or ulcerous.

With the systematic thoroughness characteristic of the authors and with a valuable selection of x-ray pictures and gross pathology specimens, the meaning of the above classification is explained which, they rightly believe, is of practical importance to the clinician in that it may aid him in the management of such cases.

WALTER CANE

IMPLANTATION RECURRENCE OF CARCINOMA OF RECTUM AND COLON: L. P. Le Quesne and A. D. Thomson. New England J. Med. 258:578 (20 March), 1958.

It has been conclusively proven that cancer cells can survive and grow when implanted on a raw surface. This can occur not only when cancer-bearing tissue is cut

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It has been conclusively proven that cancer cells can survive and grow when implanted on a raw surface. This can occur not only when cancer-bearing tissue is cut

through with a knife but also when cancer cells are shed into a hollow viscus as can occur in cancer of the large bowel.

The authors present three cases which tend to prove that implantation recurrence is possible. One was a recurrence of a sigmoid carcinoma in the suture line following excision. The second case occurred as a superficial growth on a raw hemorrhoidectomy wound, the hemorrhoidectomy having been performed about three weeks prior to the sigmoid resection and the third case illustrated an implantation recurrence in the perineum following a Miles procedure in which the rectum had been entered inadvertently.

ALEXANDER ZABIN

CECAL ILEUS: AN UNDESCRIBED AND HELPFUL SIGN IN ACUTE APPENDICITIS: Lester M. May, Francis E. O'Neill and S. W. Allen. Texas J. Med. 54:92 (Feb.), 1958.

The clinical picture of acute appendicitis is at times quite variable, especially in the young or aged. The authors describe a new finding, namely a localized cecal ileus, evident radiologically without other significant paralytic ileus. Increase in, or persistence of, a cecal ileus on serial radiographs in their cases was strong evidence of a gangrenous appendicitis with localized peritonitis. When present, the cecal ileus is a more positive diagnostic sign of acute appendicitis than is a localized small bowel ileus.

SAMUEL M. GILBERT

COLONIC BY-PASS IN GASTROJEJUNOCOLIC FISTULAS: C. Couinaud and A. Descamps. Presse Medicale 24:542-543 (26 March), 1958.

The authors review the various procedures proposed in gastrojejunocolic fistulas when a two-stage operation is still imposed by a very precarious state of health. Right colonic fistulas allow a drastic improvement by suppressing the permanent infection of the upper digestive tract. Ileosigmoidostomy was advocated by A. Gosset in 1906, then by Lahey in 1943. The main criticism is in the latter's technic, the suppression of the greater part of the colon during the subsequent stage. It was defended again in 1957 by McLeod and Galloway, but the results do not seem to have been very satisfactory indeed. In the authors' case, a large gastrojejunocolic communication was not improved by a former right colonic fistula, because of a huge deperdition of digestive juices through the opening; this is unusual, in most cases cachexia is the result of diarrhea, due to an infectious jejunitis, and the opening functions from the colon towards the stomach, and not as in this case from the stomach towards the colon. In a second stage, the fistula was excluded by section and closure of the colon on each side of the ulcer. The procedure was followed by a quick recovery and the radical cure was completed on a third stage. Nowadays two-stage operation is most unusual in those cases, but when needed, this procedure seems better than a right colonic fistula which is most uncomfortable for the patient and a ileosigmoidostomy which ends in the loss, at the very least functionally of nearly all the colon.

RECTAL BLEEDING IN INFANTS AND CHILDREN: J. C. Rathbun. J. Lancet. 78:86 (March), 1958.

Rectal bleeding is fairly common in infants and children and it is sometimes difficult to decide between serious and benign lesions. As a general rule bright red blood comes from a lower portion of the gastrointestinal tract, but this may prove wrong in special cases. The most frequent and serious cause of blood in the stools is intussusception and this condition must be excluded at once, as a missed diagnosis in such incidences may be fatal. This condition occurs primarily between the ages of 5 to 7 months in a well child.

The author classifies the causes of rectal bleeding as seen in office practice and also classifies the more serious cases seen in hospital practice, intussusception constitutes 35 per cent and leukemia 20 per cent of

all bleeders seen in hospital practice. The most common error in rectal bleeding is due to discoloration to the stools by drugs such as achromycin, foods, such as, beets or tomatoes, and uric acid.

JOHN E. COX

AMEBIASIS AS SEEN IN AN OFFICE PRACTICE: R. Bretney Miller. Am. J. M. Sc. 235:261-265 (March), 1958.

The author points out that there are many unsuspected cases of amebiasis not properly diagnosed because the mildness of the symptoms and failure to examine the stool in a satisfactory manner mislead the physician. He suggests the use of polyvinal alcohol and the use of ten per cent formalin as the methods of choice to permit accurate stool examinations.

BERNARD FARFEL

LIVER AND BILIARY TRACT

THE MANAGEMENT OF ASCITES AND PORTAL HYPERTENSION IN CHRONIC LIVER DISEASE: C. M. Luke. New Zealand M. J. 57:38 (Feb.), 1958.

Reduction of ascites and improvement of hepatic function are the practical aims of therapy. In general there is agreement on rest, adequate nutrition to include a high caloric diet with adequate protein and carbohydrate. There is little evidence that vitamins or amino acids have any specific action other than to relieve a deficiency if this should exist. Factors such as hemorrhage, alcoholism, infection, etc., which may have precipitated hepatocellular failure must be promptly and energetically treated. Depletion of body sodium is important and must be attacked with all methods. Abdominal paracentesis is recommended only as an initial procedure to alleviate gross ascites.

The management of portal hypertension is predicated upon the results of certain necessary investigations. General measures of treatment include diet and abstention from alcohol. The treatment of acute esophageal hemorrhage will include the usual supportive measures of blood transfusion and sedation. Since hepatic coma may complicate such a hemorrhage a low protein diet is given during the early stages. The value of gastroesophageal tamponage is still debated, but when properly applied can control the bleeding in many cases.

The value of portocaval anastomosis is becoming more widely confirmed. Operative mortality and risks of recurrence are becoming smaller. Selection of patients for operation demands full clinical investigation which should include transplenic venography. The criteria for operability are usually that jaundice and ascites should be minimal or absent, that the serum albumin level should be above 3.0 gm. per cent, that there should be no history of hepatic coma, that the bromsulfalein retention should be less than ten per cent and that the prothrombin time should be normal. Alternate operative procedures are discussed and their value in special cases is set forth. Surgery is playing an increasingly important role in the treatment of portal hypertension and the author suggests that in time emergency operation will be considered in all cases where hemorrhage is persistent and liver function is not seriously impaired.

LOUIS A. ROSENBLUM

THE DIAGNOSIS OF SURGICAL JAUNDICE: C. A. R. Schulenburg. Central African J. Med. 4:61 (Feb.), 1958.

Pain precedes jaundice in surgical conditions such as stone and cancer of the head of the pancreas, while the early symptoms in "medical jaundice" consist of anorexia, weakness, fatigue, and nausea. An obstructive jaundice radiates pain to the back and right shoulder while there is no radiation of the vague pain in the liver region as may be felt in hepatitis. Weight-loss is suggestive of malignancy. Fluctuating jaundice suggests common duct stones. Itching of the skin suggests obstructive jaundice. The urine becomes dark in obstructive jaundice at an early stage. Pale stools may occur in

obstructive jaundice but this may also occur early and temporarily in hepatocellular jaundice. Hemolytic jaundice usually has a familial history.

Physical examination should include a careful description of the size, shape, and consistency of the liver, the size of the spleen—whether palpable or unpalpable—, and the gallbladder. *Spider angiomata* should be carefully searched for and ascites, if present, in the abdomen.

Laboratory investigations suggest only a few tests—elevated alkaline phosphatase and serum cholesterol indicate obstructive jaundice. Hepatocellular disease with liver damage is indicated by elevated cephalin or thymol flocculation and turbidity tests, together with decreased serum albumin and reversed albumin/globulin ratio.

A response to ACTH in acute hepatitis is diagnostic while in obstructive jaundice there is no response.

The author also describes a condition now seen following virus diseases, arsphenamine, methyl testosterone and chlorpromazine. He describes primary intrahepatic cholestasis as a confusing and difficult condition which can be proven only by liver biopsy or operation.

This is a very constructive paper and one is impressed by the simplicity of the approach to the problem. In his final summary, the author states that if it is impossible to make a diagnosis, surgery is indicated before the condition becomes too critical.

I. Henry Einsel

SPONTANEOUS PERFORATION OF THE COMMON HEPATIC DUCT: Leo E. Braunstein and Dionisio Y. Wee. Illinois M. J. 113:63 (Feb.), 1958.

The authors discuss a case of spontaneous perforation of the common duct with bile leakage in a case of acute cholecystitis. There was no obstruction in the bile duct and the perforation was just proximal to the cystic duct entrance. The authors reviewed the literature and found only four other cases of spontaneous perforation of the common duct without any obstructing lesions. The clinical picture in this case was that of a severe acute cholecystitis without a palpable mass. The postoperative course was uneventful.

Jules D. Gordon

CHRONIC IDIOPATHIC JAUNDICE: I. N. Dubin. Am. J. Med. 24:268 (Feb.), 1958.

Dubin has reviewed all known cases of the so-called Dubin-Johnson syndrome in order to delineate our current knowledge of the subject. Chronic idiopathic jaundice is an uncommon disease which tends to run in families and to be more common in the male sex. So far only one case has been found in a Negro. In about half the cases the disease begins at birth or at puberty. Most patients complain of abdominal pain in the region of the liver; weakness, anorexia, nausea or vomiting, and diarrhea are less common. Symptoms tend to occur during bouts of jaundice and disappear when jaundice wanes. Some patients seem to be free of symptoms at all times. Jaundice is recurrent and fluctuates in intensity. The liver is clinically enlarged and tender in about half the cases. Dark urine occurs in 50 per cent of the cases and pale stools in 12 per cent. The pigment in the serum behaves like bilirubin, as judged by Ehrlich's diazo reaction. The liver cell is able to conjugate indirect bilirubin with glucuronic acid and convert it to direct bilirubin, but it cannot properly excrete the latter into the bile so that direct bilirubin is somehow regurgitated back into the blood either directly or through the lymph.

Additional evidence for inadequate hepatic excretion is found in the retention of bromsulfalein. In about half the cases the cephalin flocculation and thymol turbidity tests give abnormal values while jaundice is present, but return to normal as soon as jaundice subsides. The gallbladder fails to visualize on oral cholecystography, even though the gallbladder is normal. This occurs even when jaundice is absent. Apparently the liver cannot excrete the dye at the normal rate. The liver is normal except for the pigmentation. There is no histologic evidence of progressive hepatic damage. The pigment in the liver probably belongs to the family of lipofuscins and occurs in liver parechymal cells. The amount of hepatic pigment is so abundant that it dis-

colors the liver grossly, giving it a green, slate blue or black hue. There is no generalized pigmentation of other tissues. In about half the cases the onset of jaundice is insidious; in others jaundice is first noted in association with or in the wake of another disease or major stress. Once instituted, the disease is apparently lifelong. Gallstones appeared in five patients, an incidence of 10 per cent. This finding is as yet not evaluated.

There is no known therapy for the disease. Nevertheless the prognosis is excellent as regards life expectancy and the absence of progressive hepatic disease. The evidence at hand indicates that the disease is a result of some inborn error of metabolism.

JOHN M. MCMAHON

ASCITES IN LIVER DISEASE, MECHANISM AND THERAPEUTIC CONTROL: Wade Volwiler. Am. J. Digest. Dis. 3:103-113 (Feb.), 1958.

The formation of ascites in any patient having liver disease is due to multiple factors. These factors vary in individual importance from case to case and thereby determine in part the wise choice of therapeutic measures to be employed for controlling a given ascitic collection. The various mechanisms causing ascites as well as the various principles of therapeutic attack are discussed and properly evaluated.

WALTER CANE

DIET AND NUTRITIONAL AIDS IN LIVER DISEASE: Victor M. Sborov. Am. J. Digest. Dis. 3:94-102 (Feb.), 1958.

In attempting to assess the role of diet and dietary supplements in the management of liver disease we face the difficult problems of delineating the exact component of the diet that is of importance. While various diets have been advocated in the management of acute viral hepatitis, the fact must be kept in mind that the gastrointestinal tract may take part in the disease process and that, even if adequate food is offered early in viral hepatitis, defective digestion and absorption may work against any preconceived program. This problem assumes even greater importance in chronic viral hepatitis and in hepatic cirrhosis when intermittent anorexia and nausea give added difficulties to the nutritionist.

WALTER CANE

ROLE OF REST AND AMBULATION IN LIVER DISEASE: Mary Ann Payne. Am. J. Digest. Dis. 3:84-93 (Feb.), 1958.

The current use of bed rest in the treatment of diseases of the liver is admittedly empiric. All observers have agreed that bed rest during the acute stage of hepatitis generally improves the immediate symptoms. Hepatic tenderness is less under conditions of rest, while increase in size and tenderness of the liver frequently occurs with ambulation. Laboratory evidence of worsening hepatic function often parallels the change in liver size and tenderness. When the resistance of the host is high, and possibly when the virus is of a low degree of virulence, no permanent deleterious effects result from relapses due to early ambulation. Recoverey progresses satisfactorily despite lack of rest. However, these clinical and laboratory signs of relapse may be the first indications of a more serious progressive hepatitis. The role of bed rest has not been tested by controlled observations under such circumstances. Until studies of this nature have been made, the judicious use of bed-rest in the treatment of the acute stages of hepatic disease is recommended.

WALTER CANE

PYOGENIC LIVER ABSCESS: (Editorial) J. M. A. Georgia 47:83 (Feb.), 1958.

It has been demonstrated that surgical drainage of the solitary pyogenic liver abscess affords a good chance for cure. Without treatment the mortality rate approaches

100 per cent because of the resulting pyemia and its complications. The disease is usually seen in younger and middle-aged adults. Clinically, it presents itself with chills, a daily spiking fever, and pain accompanied by tenderness in the right upper quadrant. Although the liver is often enlarged, jaundice is infrequent. The blood count reveals a leucocytosis, but the cultures of the pus are sterile in 50 per cent of cases. Radiographic studies show an elevated right diaphragm with decreased movement. The liver shadow may appear to be enlarged.

The patient with multiple abscesses usually has more severe symptoms and a history of a preceding gastrointestinal infection. This form of hepatic disease is best treated with massive doses of antibiotics without surgical intervention.

THEODORE COHEN

INFECTIOUS HEPATITIS: Robert Ward, Saul Krugman, Joan P. Giles, A. Milton Jacobs and Oscar Bodansky. New England J. Med. 258:407 (27 Feb.), 1958.

This is an institutional study on the control of viral hepatitis. Gamma globulin was seen to reduce the prevalence of hepatitis and this protection appeared to last for seven to nine months. The virus was demonstrated to be in the stool three weeks prior to the onset of clinical jaundice. It was concluded the gamma globulin was an effective means of controlling outbreaks of viral hepatitis in an institution.

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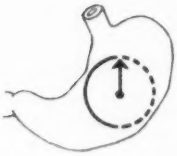

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INTERNATIONAL CONGRESS ON THE BILIARY FUNCTION: Two Volumes, 634 pages, 126 illustrations, Masson et Cie, Paris, 1958. Price, 5,000 fr.

These two books represent the transactions of the convention on biliary function held in Vittel, France, June, 1958. The first part deals with physiology, with articles on the mechanism of the various types of icterus, the exploration of the biliary ducts during operation, the influence of hormones, isotopes and hepatobiliary function, etc. The second part contains articles on pathology and therapy. It will be of interest to American physicians to read about liver therapy in the tropics and many other subjects. The second volume of this publication contains the papers on the therapeutic management at Vittel, which is situated in the Vogues Mountains in the eastern part of France and is a well known Spa for biliary diseases. At this Spa, hydrotherapy has been used for liver diseases for many generations.

HOW TO WRITE SCIENTIFIC AND TECHNICAL PAPERS: Sam F. Trelease, Columbia University, New York, N. Y. 185 pages. The Williams & Wilkins Company, Baltimore, Md. 1958. Price $3.25.

Persons who prepare a thesis or a short paper to be read before a lay or professional society, will do well to peruse this concise and comprehensive little volume. The author explains the use of punctuation, tenses, quotations, acknowledgments, conclusions, illustrations, bibliography, charts and diagrams in the preparation of a manuscript, whether for publication or otherwise.

It is recommended as a useful reference text.

AN INTERNATIONAL SYMPOSIUM ON ALDOSTERONE: Edited by Alex F. Muller, M.D. and Cecilia M. O'Connor, B.Sc. 232 pages, illustrated. Little, Brown & Company, Boston, Mass., 1958. Price $8.00.

A highly technical book dealing with a hormone which is of great importance to endocrinologists and electrolyte experts.

Discussion of the interrelationship of potassium deficiency and renal disease and the effect this hormone has on ascites is recommended as worthwhile reading.

DIFFICULT DIAGNOSIS. A GUIDE TO THE INTERPRETATION OF OBSCURE ILLNESS: H. J. Roberts, M.D., Diplomate of American Board of Internal Medicine; Fellow of the American College of Chest Physicians; Associate of the American College of Physicians; Staff, Good Samaritan Hospital and St. Mary's Hospital, West Palm Beach, Fla. 913 pages. W. B. Saunders Company, Philadelphia, Pa., 1958. Price $19.00.

If the reviewer would be asked what text he would like to consult in order to arrive at a definite clinical diagnosis, his answer would be "Difficult Diagnosis" by Roberts.

In this large volume, the student and physicians will find answers to almost all of his puzzling aspects of a given case. Extensive references to parts one and two plus a general index, complete this highly recommended book.

POISONING—A GUIDE TO CLINICAL DIAGNOSIS AND TREATMENT. SECOND EDITION: W. F. von Oettingen, M.D., Ph.D., National Institute of Health, U.S. Public Health Service, U.S. Department of Health, Education and Welfare. 627 pages. W. B. Saunders Company, Philadelphia, Pa., 1958. Price $12.50.

It is recommended that a copy of this book be handy in all police, fire and other rescue stations. It should be a required text in medical, pharmacy and nurses' training schools.

Poisoning in all aspects is fully covered

and suggested treatment recommended.

The author and publisher are commended for publishing this useful and "must" text.

THE CARE OF THE GERIATRIC PATIENT: Edited by E. V. Cowdry, Ph.D. Sc.D. (Hon.) Director of Wernse Cancer Research Laboratory, Washington University School of Medicine; Formerly President of the Gerontological Congress; etc., etc. 438 pages. The C. V. Mosby Company, St. Louis, Mo., 1958. Price $8.00.

A well written and well printed book dealing with the care of the aged by well known clinicians, hospital administrators and nurses who come in contact with oldsters.

Among some of the well known contributors are E. M. Bluestone, M.D., New York, N. Y., a former Administrator of Montefiore Hospital, now Professor of Public Administration, New York University, and Assistant Professor of Hospital Administration, Columbia University; Blanche R. Gubersky, R.N., B.S., M.A., Director of Nursing Service, Home for Aged and Infirm Hebrews, New York, N. Y.; Howard A. Rusk, A.B., M.D., Sc.D. (Hon.), L.L.D. (Hon.), New York, N. Y., Professor and Chairman of the Department of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center and Alice M. Waterhouse, M.D., M.S.P.H., Bethesda, Md., Medical Advisor, United States National Health Survey, Public Health Service.

Dr. Cowdry's book should be on the desk of every physician, hospital administrator and welfare worker.

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[1] *American Journal of Gastroenterology 28:439, 1957.*

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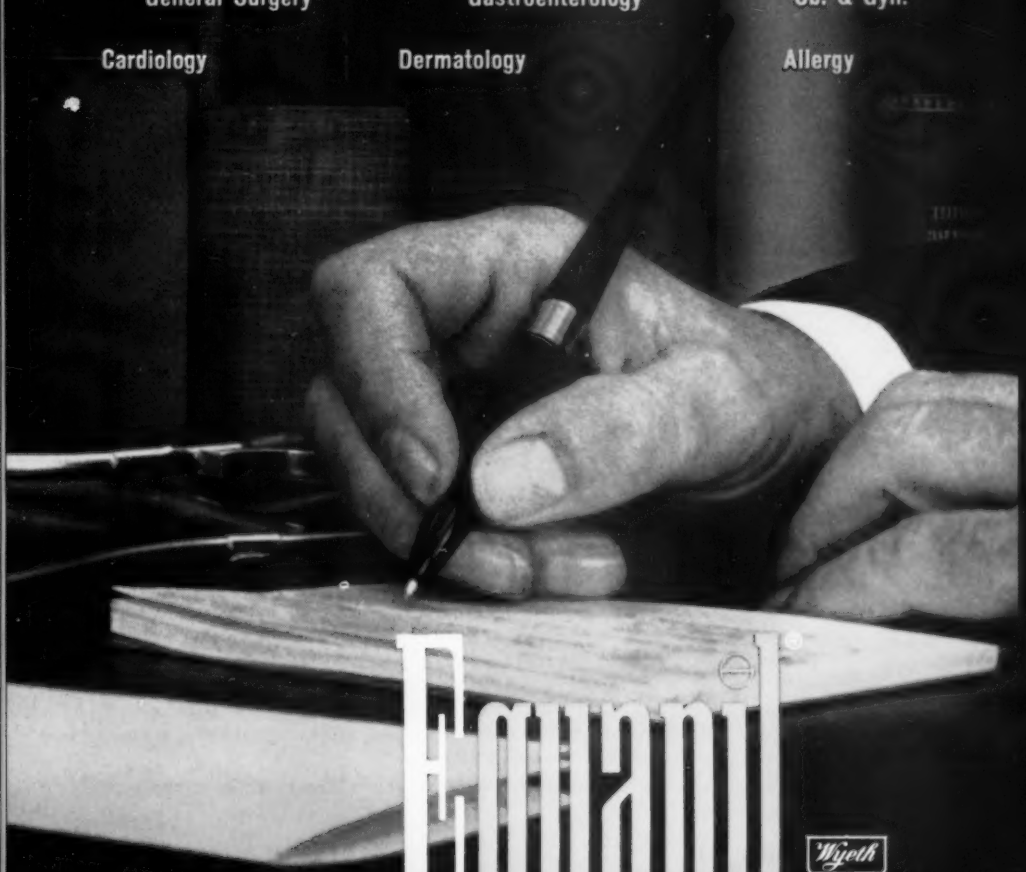

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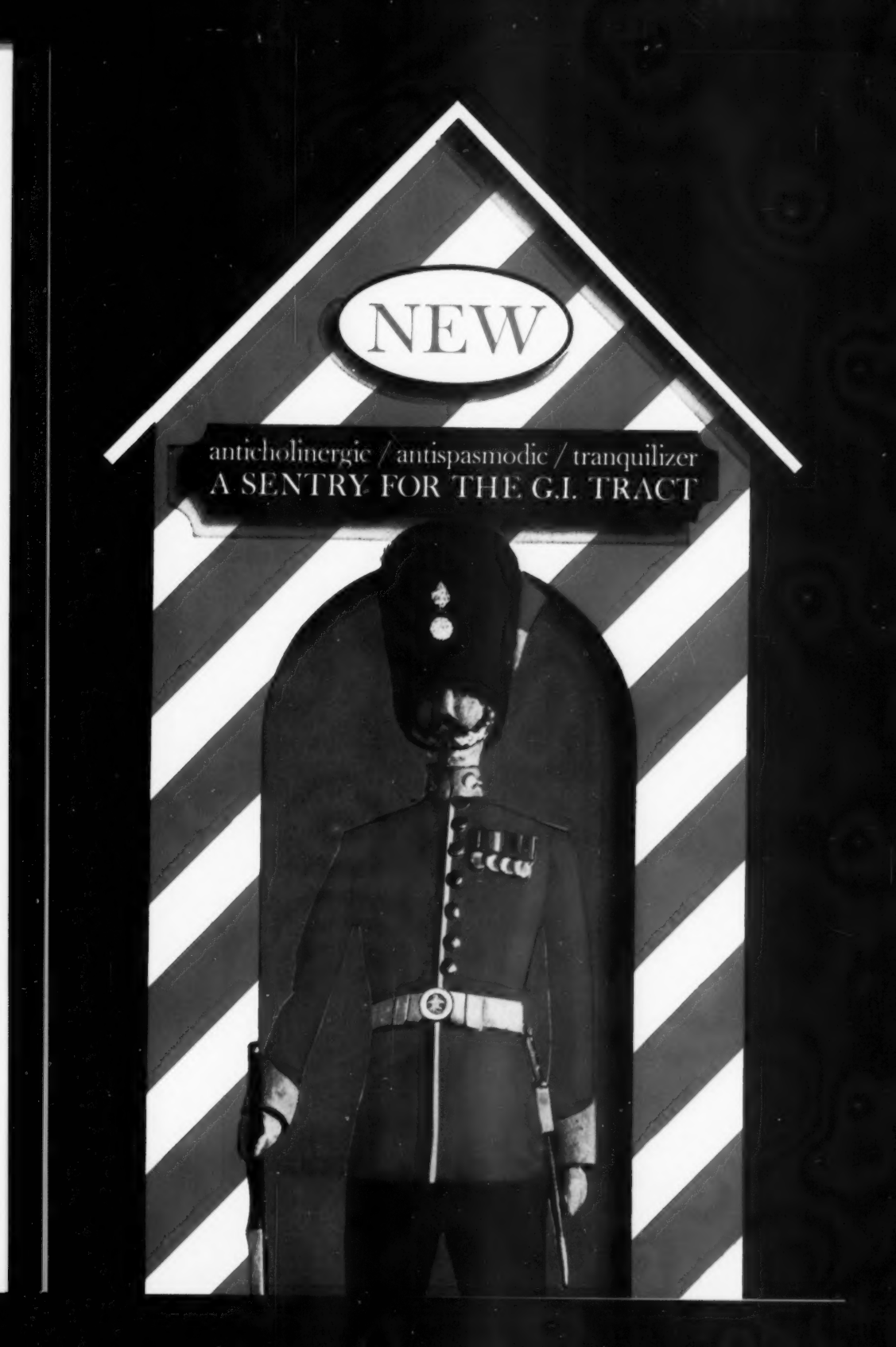
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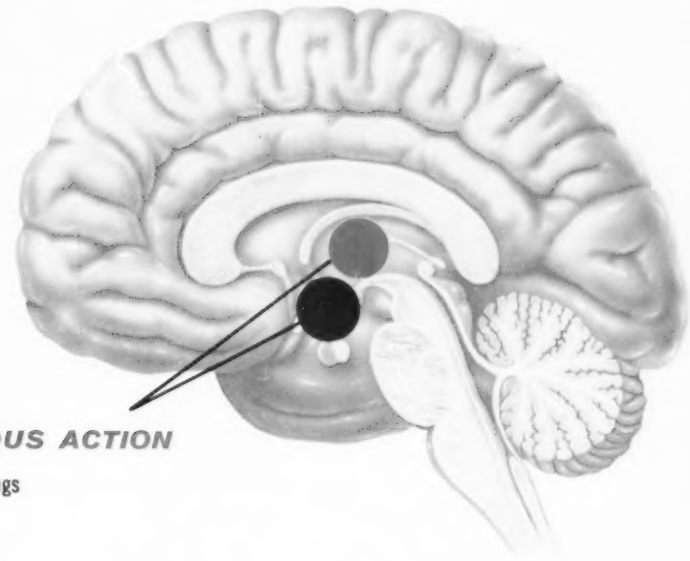

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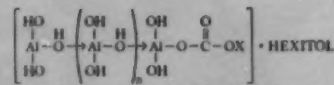

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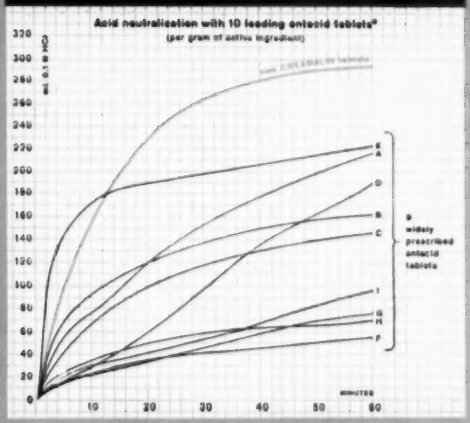

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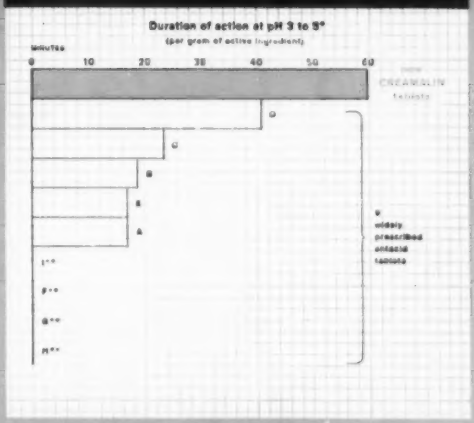

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Supplied: Bottles of 50, 100, 200 and 1000.

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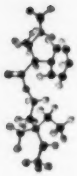
three-way mechanism of action  in one molecule

A long step forward

"MUREL"®

Brand of Valethamate bromide

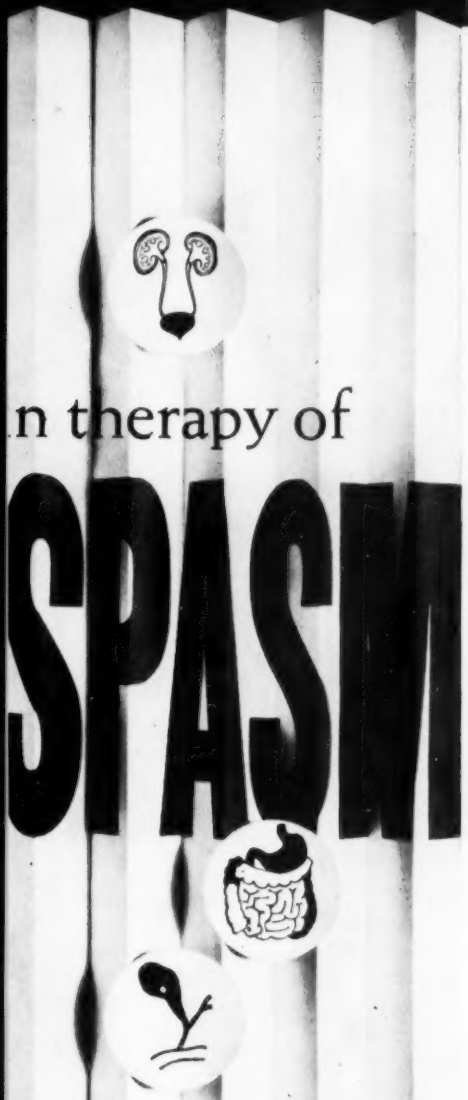
"MUREL" is the newest development of research in quaternary ammonium compounds. It advances today's therapy of G.U., G.I. and biliary tract spasm toward the ideal in decisive relief without intolerance or drug-induced complications. "MUREL" also supplements peptic ulcer therapy by breaking the chain reaction of spasm-pain.

Dosage: Mild to moderate cases: initially, 1 or 2 tablets four times daily. Acute or severe cases: 1 to 2 cc. (10-20 mg.) intravenously or intramuscularly every four to six hours up to maximum of 60 mg. in 24 hour period. The higher dosage range is usually required in spasm of G.U. and biliary tract.

Supplied: "MUREL" Tablets—10 mg. Valethamate bromide, bottles of 100 and 1,000. "MUREL" Injectable—10 mg. per cc., vials of 5 cc. (Also available: "MUREL" with Phenobarbital Tablets—10 mg. Valethamate bromide with ¼ gr. phenobarbital per tablet, bottles of 100 and 1,000.)

Ayerst Laboratories • New York 16, N. Y. • Montreal, Canada

Ayerst®



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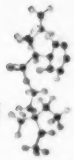
SPASM



Three-Way Mechanism of Action in One Molecule

"MUREL" unites three mechanisms specific for smooth muscle spasmolysis: (1) anticholinergic inhibition of parasympathetic transmission, (2) musculotropic action with specific affinity for smooth muscle fibers, and (3) ganglionic blocking action at the synaptic level.

Precludes or Minimizes Untoward Side Effects

"MUREL" is especially well tolerated because: (1) coordination of the three component actions permits significantly low dosages and also reduces reaction potential of any one mechanism, (2) a natural specificity confines the anticholinergic action to the effector cells of smooth muscle, (3) definite but transient ganglionic blocking action eliminates undesirable parasympathetic disturbances, (4) rapid detoxification and excretion prevent cumulative effect.

Widely Useful— Clinically Demonstrated

"MUREL" extends the clinical scope of dependable spasmolytic therapy, with indications ranging from mild to severe hypertonicity. In postoperative *genitourinary* spasm, cystitis and pyelitis—effective relief of pain and spasm was noted in all of 75 patients.[1] In *peptic ulcer*—complete or substantial relief from the pain/spasm cycle was reported in 119 out of 127 patients.[2,3] In *biliary spasm* and chronic cholecystopathies with or without stones—prompt, complete control of spasm was obtained in 20 out of 22 patients.[3]

Peiser[2] states that even extremely strong convulsive abdominal pain and violent vomiting could be eliminated or substantially improved, and no unpleasant side effects or toxic reactions were noted at any time.

1. Berndt, R.: Arzneimittel-Forsch. 5:711 (Dec.) 1955.
2. Peiser, U.: Med. Klin. 50:1479 (Sept. 2) 1955.
3. Winter, H.: Medizinische, p. 1206 (Aug. 27) 1955.

A salesman, aged 43, had a radiographically proved ulcer and a 3-year history of epigastric pain and discomfort occurring between meals and during the night. Response to therapy with synthetic anticholinergics, phenobarbital and belladonna had been consistently poor.

One 'Combid' *Spansule* capsule q12h was prescribed. The patient became asymptomatic shortly after therapy with 'Combid' was initiated, and has remained so for over a year. A slight dryness of the mouth was the only untoward reaction reported.

'Combid' (Compazine‡, 10 mg.; and the anticholinergic Darbid§, 5 mg.) reduces secretion, spasm, nausea and vomiting, and anxiety, tension and stress for 10 to 12 hours after just one oral dose.

Combid* Spansule†

b.i.d.

Smith Kline & French Laboratories, Philadelphia

★T.M. Reg. U.S. Pat. Off. †T.M. Reg. U.S. Pat. Off. for sustained release capsules, S.K.F.
‡ T.M. Reg. U.S. Pat. Off. for prochlorperazine, S.K.F.
§ T.M. Reg. U.S. Pat. Off. for isopropamide, S.K.F.

Senokot®

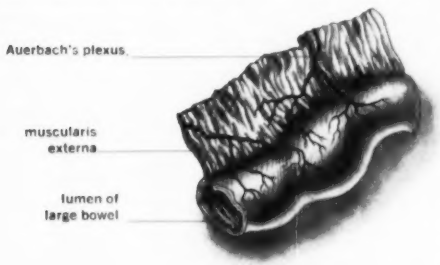
STANDARDIZED CONCENTRATE OF TOTAL ACTIVE PRINCIPLES OF CASSIA ACUTIFOLIA PODS. PURDUE FREDERICK

TABLETS / GRANULES

PREFERRED IN CONSTIPATION

"...acts in a way almost indistinguishable from the normal physiologic mechanism..."[1]

'Senokot' tablets and granules reproduce the physiologic process of normal defecation by specifically and selectively stimulating Auerbach's plexus – the large bowel neurogenic regulator. As a result of this pharmacologically unique action, 'Senokot' assures:



Typical Segment of Large Bowel

- predictable, controllable, reproducible evacuation
- gentle, strain-free elimination 8-10 hours after bedtime administration
- no mucosal irritation or griping
- normalized stool consistency
- reduction of dosage and withdrawal of medication
- rehabilitation of the large bowel mechanism

'Senokot' tablets and granules are compatible with all medications and offer maximum convenience and palatability, for all patients in all conditions.

SUPPLY: *Tablets:* Small and easy to swallow, in bottles of 100. *Granules:* Cocoa-flavored, in 8 and 4 ounce canisters.

CITED REFERENCE: 1. Herland, A.L., Lowenstein, A.: Quart. Rev. Surg. Obst. & Gynec. 14:196 (Dec.) 1957.

THE EFFECTIVENESS OF THE PRODUCTS IN THE FAMILY OF 'SENOKOT' CONTINUES TO BE DOCUMENTED BY CLINICAL AND LABORATORY INVESTIGATIONS WHICH CONSTITUTE THE FASTEST GROWING BIBLIOGRAPHY ON CONSTIPATION. *(Available upon request to the Medical Director)*

The Purdue Frederick Company

DEDICATED TO PHYSICIAN AND PATIENT SINCE 1892

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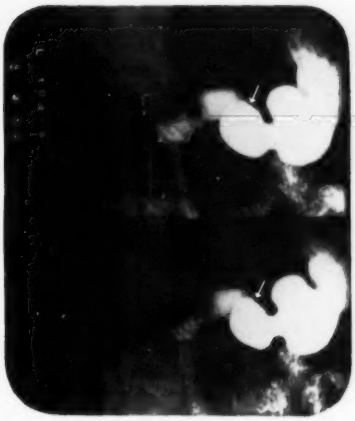
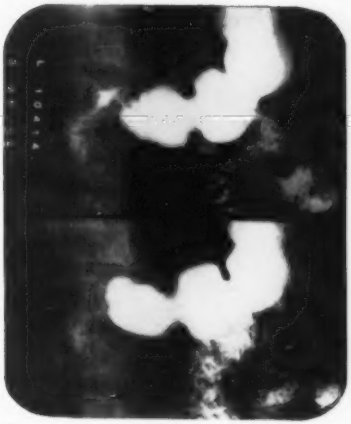
relieve the tensio

—and control its G.I. sequelae



Patient A.S., age 53.
Intermittent crises of severe pain over 2 year period; hospital management with Sippy regimen provided relief of symptoms; however, symptoms recurred after each sojourn.



PATHIBAMATE *(Tabs. † t.i.d. and H.S.)*; prompt relief of symptoms. Radiograph (21 days later) confirms healing of minute lesser curvature gastric ulcer crater.

predictable results in the control of tension and G.I. trauma

Pathibamate®

Meprobamate with PATHILON® Tridihexethyl Chloride* LEDERLE

Used prophylactically in anticipation of periods of emotional stress, or therapeutically to relieve tension and curb hypermotility and hypersecretion, PATHIBAMATE is particularly well-formulated for the control of gastrointestinal disorders.

PATHIBAMATE combines Meprobamate (400 mg.)—the noted tranquilizer-muscle relaxant widely accepted for management of tension and anxiety states—and PATHILON (25 mg.)—an extremely well-tolerated anticholinergic, long noted for prompt symptomatic relief based on peripheral atropine-like action with few side effects.

Indications:
Duodenal ulcer, gastric ulcer, intestinal colic, spastic and irritable colon, ileitis, esophageal spasm, anxiety neurosis with gastrointestinal symptoms, gastric hypermotility.

Supplied:
Bottles of 100 and 1,000. Each tablet (yellow, ½-scored) contains Meprobamate, 400 mg.; PATHILON Tridihexethyl Chloride, 25 mg.

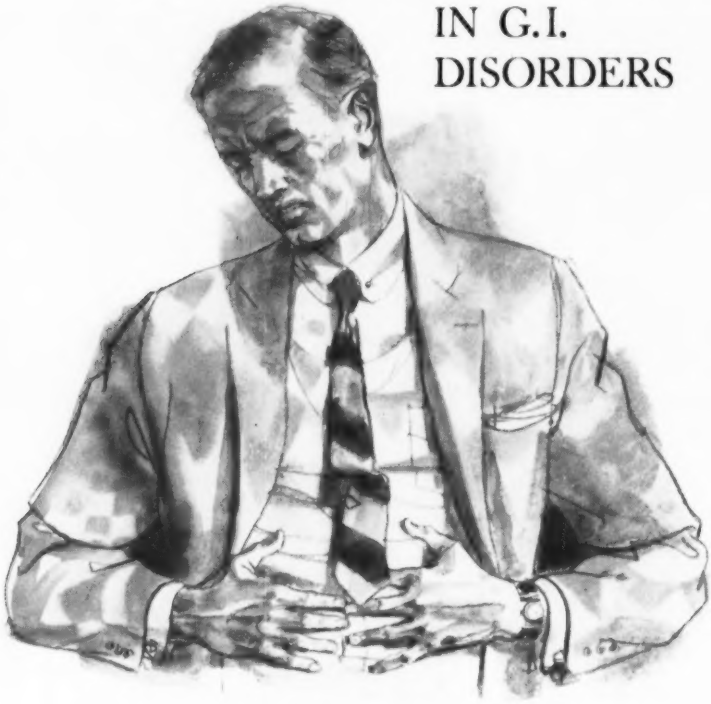
Administration and Dosage:
1 tablet three times a day at mealtimes and 2 tablets at bedtime. Adjust dosage to patient response. Contraindicated in glaucoma, pyloric obstruction, and obstruction of the urinary bladder neck.

Also Available: PATHILON in four forms — ***Tablets*** of 25 mg., plain (pink) or with *phenobarbital*, 15 mg. (blue); ***Parenteral*** — 10 mg./cc. — 1 cc. ampuls; ***Pediatric Drops*** — 5 mg./cc. — dropper vials of 15 cc.

*PATHILON is now offered as tridihexethyl chloride instead of the iodide, an advantage permitting wider use, since the latter could interfere with the results of certain thyroid function tests.

Lederle LEDERLE LABORATORIES, A Division of AMERICAN CYANAMID COMPANY, Pearl River, New York

CONTROLS NERVOUS TENSION IN G.I. DISORDERS



MOST FUNCTIONAL G.I. DISORDERS "can be considered a manifestation of a general psychoneurotic disturbance." (Rossien, A. X.: J. Am. Geriatrics Soc. 5:430, April 1957.)

TREATMENT WITH MILTOWN

- improved control in 15 of 19 cases of common functional G.I. disturbances[1]
- helped the majority of 23 cases of psychosomatic stomach distress[2]
- controlled emotional components of spastic colitis,[3] chronic ulcerative colitis,[4] and psychophysiologic dyspepsia[5]

Miltown®
meprobamate (Wallace)

Miltown causes no adverse effects on gastric secretions, emptying time or motility.[6]

Available in 400 mg. scored and 200 mg. sugar-coated tablets. Also available as MEPROSPAN® (200 mg. meprobamate *continuous release* capsules).

1. Phillips, R. E.: Am. Pract. & Digest Treat. 7:1573, Oct. 1956. 2. Selling, L. S.: J.A.M.A. 157:1591, April 30, 1955. 3. Altschul, A. and Billow, B.: New York J. Med. 57:2361, July 15, 1957. 4. Ross, S. T.: Postgrad. Med. 23:24, Jan. 1958. 5. Tacket, H. S.: Am. Pract. & Digest Treat. 8:597, April 1957. 6. Bodi, T., Wirts, C. W., Jr. and Menduke, H.: Am. J. Gastroenterol. 29:643, June 1958.

LM-7/09 ®TRADE-MARK

WALLACE LABORATORIES, *New Brunswick, N. J.*

normal bowel function requires intestinal contents of proper consistency

KONSYL®

A vegetable concentrate of naturally occurring hemicelluloses

Provides just the moist, smooth, effective bulk so essential to normal peristalsis. It precipitates formed stools in cases of simple constipation and non-specific diarrhea. It hastens the rate of improvement in irritable colon cases. It contains no artificial or irritating substances and is calorie-free. Furthermore, KONSYL is available at significantly lower-cost-to-patient prices. So . . .

to normalize use **KONSYL**

Made by BURTON, PARSONS & COMPANY, *Since 1932*
Originators of Fine Hydrophilic Colloids
Washington 9, D. C.

NOW even many cardiac patients may have THE FULL BENEFITS OF CORTICOSTEROID THERAPY

DECADRON—the new and most potent of all corticosteroids, **eliminated fluid retention in all but 0.3 percent of 1500 patients†, and induced beneficial diuresis in nearly all cases of pre-existing edema.**

Decadron*

DEXAMETHASONE

treats more patients more effectively

Therapy with DECADRON has also been distinguished by virtual absence of diabetogenic effects and hypertension, by fewer and milder Cushingoid reactions, and by freedom from any new or "peculiar" side effects. Moreover, DECADRON has helped restore a "natural" sense of well-being.

†Analysis of clinical reports.

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